CITY OF REDLANDS

MASTER PLAN OF DRAINAGE (MPD)



# **TECHNICAL APPENDIX A.2**

Rational Method – County "Modified" Files (AMC II) (100-, 25-, and 10-year)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

### Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 10110 (FILE LR0101ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0101ZZ.DAT

TIME/DATE OF STUDY: 14:24 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	HALL -	CKOMN 10	SIREEI-CROSSFALL.	COND	GOIIEK-	-GEOMET1	VIEO.	MAININING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	==========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

```
17 20.0
           10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180
18 26.0
           15.0
                  0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0
           20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
   WATERSHED LAG = 0.80 * Tc
        S-GRAPH TYPE
                                PERCENTAGE (DECIMAL)
                                   1.000
      VALLEY (DEVELOPED)
       FOOTHILL
                                    0.000
       MOUNTAIN
                                    0.000
       VALLEY (UNDEVELOPED) / DESERT
                                    0.000
       DESERT (UNDEVELOPED)
                                    0.000
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
*******************
 FLOW PROCESS FROM NODE 10100.00 TO NODE 10101.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 656.20
 ELEVATION DATA: UPSTREAM(FEET) = 2270.00 DOWNSTREAM(FEET) = 2242.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.766
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.594
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                              αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
                     A 5.28 0.86 1.000
                                                     46 17.77
 "OPEN BRUSH"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF (CFS) = 8.24
 TOTAL AREA (ACRES) = 5.28 PEAK FLOW RATE (CFS) =
                                                 8.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 8.67
*****************
 FLOW PROCESS FROM NODE 10101.00 TO NODE 10102.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 2242.00 DOWNSTREAM ELEVATION (FEET) = 2225.00
 STREET LENGTH (FEET) = 366.50 CURB HEIGHT (INCHES) = 6.0
       Date: 04/21/2014
                     File name: LR0101ZZ.RES
                                                    Page 2
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   16.15
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.39
   HALFSTREET FLOOD WIDTH (FEET) = 12.96
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.73
 STREET FLOW TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 20.51
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.380
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                     A
 "OPEN BRUSH"
                                3.94 0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 3.94 SUBAREA RUNOFF (CFS) = 5.39
 EFFECTIVE AREA(ACRES) = 13.19 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 13.2 PEAK FLOW RATE (CFS) = 18.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.59
 FLOW VELOCITY (FEET/SEC.) = 4.60 DEPTH*VELOCITY (FT*FT/SEC.) = 1.83
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10103.00 = 1373.24 FEET.
******************
 FLOW PROCESS FROM NODE 10103.00 TO NODE 10104.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2210.00 DOWNSTREAM ELEVATION(FEET) = 2195.00
 STREET LENGTH(FEET) = 288.50 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    20.43
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.04
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 21.45
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.317
```

Date: 04/21/2014 File name: LR0101ZZ.RES

Page 4

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                  TOTAL AREA (ACRES) = 20.7 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                              αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 NATURAL FAIR COVER
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
 "OPEN BRUSH"
                    A 3.63 0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
                                                                                  DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.79
 SUBAREA AREA(ACRES) = 3.63 SUBAREA RUNOFF(CFS) = 4.76
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.36 DEPTH*VELOCITY (FT*FT/SEC.) = 2.01
 EFFECTIVE AREA(ACRES) = 16.82 AREA-AVERAGED Fm(INCH/HR) = 0.86
                                                                                 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10105.00 = 1997.28 FEET.
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
                                                                                ******************
 TOTAL AREA (ACRES) = 16.8 PEAK FLOW RATE (CFS) =
                                                         22.06
                                                                                  FLOW PROCESS FROM NODE 10105.00 TO NODE 10106.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                ______
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.13
                                                                                  UPSTREAM ELEVATION(FEET) = 2185.00 DOWNSTREAM ELEVATION(FEET) = 2173.00
 FLOW VELOCITY (FEET/SEC.) = 5.21 DEPTH*VELOCITY (FT*FT/SEC.) = 2.13
                                                                                 STREET LENGTH (FEET) = 340.04 CURB HEIGHT (INCHES) = 6.0
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10104.00 = 1661.74 FEET.
                                                                                 STREET HALFWIDTH (FEET) = 18.00
*********************
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 FLOW PROCESS FROM NODE 10104.00 TO NODE 10105.00 IS CODE = 63
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
______
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2195.00 DOWNSTREAM ELEVATION(FEET) = 2185.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET LENGTH (FEET) = 335.54 CURB HEIGHT (INCHES) = 6.0
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 28.07
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.46
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 16.79
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.78
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.21
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 23.94
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.170
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.81
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  NATURAL FAIR COVER
                                                                                  "OPEN BRUSH" A 4.19 0.86 1.000
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.48
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.97
                                                                                  SUBAREA AREA (ACRES) = 4.19 SUBAREA RUNOFF (CFS) = 4.94
 STREET FLOW TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 22.75
                                                                                  EFFECTIVE AREA(ACRES) = 24.85 AREA-AVERAGED Fm(INCH/HR) = 0.86
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.237
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
                                                                                  TOTAL AREA (ACRES) = 24.9 PEAK FLOW RATE (CFS) =
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 NATURAL FAIR COVER
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
                A 3.84 0.86 1.000 46
 "OPEN BRUSH"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
                                                                                  DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.10
 SUBAREA AREA (ACRES) = 3.84 SUBAREA RUNOFF (CFS) = 4.76
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.81 DEPTH*VELOCITY (FT*FT/SEC.) = 2.25
 EFFECTIVE AREA(ACRES) = 20.66 AREA-AVERAGED Fm(INCH/HR) = 0.86
                                                                                  LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10106.00 = 2337.32 FEET.
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
```

Date: 04/21/2014 File name: LR0101ZZ.RES Page 5 Date: 04/21/2014 File name: LR0101ZZ.RES Page 6

25.60

29.29

```
******************
 FLOW PROCESS FROM NODE 10106.00 TO NODE 10107.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
ELEVATION DATA: UPSTREAM(FEET) = 2173.00 DOWNSTREAM(FEET) = 2163.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 442.71 CHANNEL SLOPE = 0.0226
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                           29.29
 FLOW VELOCITY (FEET/SEC.) = 2.08 FLOW DEPTH (FEET) = 0.53
 TRAVEL TIME (MIN.) = 3.55 Tc (MIN.) = 27.49
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10107.00 = 2780.03 FEET.
********************
 FLOW PROCESS FROM NODE 10107.00 TO NODE 10107.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 27.49
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.997
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                        Aρ
                                               SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   A
                           5.70
                                   0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.70
                           SUBAREA RUNOFF(CFS) = 5.83
 EFFECTIVE AREA(ACRES) = 30.55 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 30.5
                          PEAK FLOW RATE(CFS) =
                                                31.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
FLOW PROCESS FROM NODE 10107.00 TO NODE 10108.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2163.00 DOWNSTREAM(FEET) = 2135.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 704.86 CHANNEL SLOPE = 0.0397
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                           31.25
 FLOW VELOCITY (FEET/SEC.) = 2.59 FLOW DEPTH (FEET) = 0.49
 TRAVEL TIME (MIN.) = 4.53 Tc (MIN.) = 32.02
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10108.00 = 3484.89 FEET.
******************
 FLOW PROCESS FROM NODE 10108.00 TO NODE 10108.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 32.02
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     A 10.49 0.86 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 10.49
                             SUBAREA RUNOFF (CFS) = 9.08
 EFFECTIVE AREA(ACRES) = 41.04 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 41.0 PEAK FLOW RATE (CFS) =
                                                     35.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 10108.00 TO NODE 10109.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2135.00 DOWNSTREAM(FEET) = 2099.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 696.28 CHANNEL SLOPE = 0.0517
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.95 FLOW DEPTH (FEET) = 0.49
 TRAVEL TIME (MIN.) = 3.94 Tc (MIN.) = 35.96
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10109.00 = 4181.17 FEET.
**********************
 FLOW PROCESS FROM NODE 10109.00 TO NODE 10109.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 35.96
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.699
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                                     SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       A
                            10.72 0.86 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 10.72
                             SUBAREA RUNOFF (CFS) = 8.10
 EFFECTIVE AREA(ACRES) = 51.76 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 51.8
                               PEAK FLOW RATE(CFS) =
                                                     39.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 10109.00 TO NODE 10110.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.822

Date: 04/21/2014 File name: LR0101ZZ.RES Page 7

File name: LR0101ZZ.RES

Date: 04/21/2014

```
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2099.00 DOWNSTREAM(FEET) = 2056.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1252.31 CHANNEL SLOPE = 0.0343
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            39.10
 FLOW VELOCITY (FEET/SEC.) = 2.56 FLOW DEPTH (FEET) = 0.55
 TRAVEL TIME (MIN.) = 8.14 Tc (MIN.) = 44.10
 LONGEST FLOWPATH FROM NODE 10100.00 TO NODE 10110.00 = 5433.48 FEET.
******************
 FLOW PROCESS FROM NODE 10110.00 TO NODE 10110.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 44.10
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.504
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FO
                                       αA
             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 17.71 0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 17.71
                           SUBAREA RUNOFF (CFS) = 10.26
 EFFECTIVE AREA(ACRES) = 69.47 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 69.5
                           PEAK FLOW RATE(CFS) =
                                                  40.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 69.5 TC (MIN.) =
                                       44.10
 EFFECTIVE AREA (ACRES) = 69.47 AREA-AVERAGED Fm (INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE (CFS) =
                     40.24
_____
 END OF RATIONAL METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0101ZZ.RES Page 9 Date: 04/21/2014 File name: LR0101ZZ.RES Page 10

\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

#### Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 10204 (FILE LR0102ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0102ZZ.DAT

TIME/DATE OF STUDY: 14:24 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGI AND HIDRAULIC MODEL INFORMATION.

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

	0.020/0.020/0.020			
18 26.0 15.0	0.020/0.020/0.020	0.67	2.00 0.0312 0.167	0.0180
19 52.0 20.0	0.020/0.020/0.020	0.67	2.00 0.0312 0.167	0.0180
1. Relative Flow as (Maximum A 2. (Depth)*(Velow *SIZE PIPE WITH A OR EQUAL TO THE U	W-DEPTH CONSTRAINTS: w-Depth = 0.20 FEET Allowable Street Flow ocity) Constraint = 6 FLOW CAPACITY GREATER UPSTREAM TRIBUTARY PIP	.0 (FT*FT THAN E.*	/S)	
*USER-SPECIFIED M.	INIMUM TOPOGRAPHIC SLO	PE ADJUST	MENT NOT SELECTED	
WATERSHED LAG =				
1 UNITS/ACRE ANI FOR DEVELOPMENTS PRECIPITATION DA SIERRA MADRE DEI	DEVELOPED" S-GRAPH FOR D LESS; AND "VALLEY DE S OF 2 UNITS/ACRE AND ATA ENTERED ON SUBAREA PTH-AREA FACTORS USED.	VELOPED" MORE. BASIS.	S-GRAPH	
*ANTECEDENT MOISTUR	RE CONDITION (AMC) II	ASSUMED F	OR UNIT HYDROGRAPH	METHOD*
******	*******	******	******	*****
FLOW PROCESS FROM	NODE 10200.00 TO NOD	E 10201.	00 IS CODE = 21	
	HOD INITIAL SUBAREA AN CENTRATION NOMOGRAPH F			
=======================================		=======		======
	LOW-LENGTH(FEET) = 6 PSTREAM(FEET) = 2060		STREAM(FEET) = 2	2040.00
Tc = K*[(LENGTH**	3.00)/(ELEVATION CHAN	GE)1**0.2	0	
SUBAREA ANALYSIS U	USED MINIMUM Tc(MIN.)	= 18.83		
	LL INTENSITY(INCH/HR)			
	SS RATE DATA(AMC II):			_
	/ SCS SOIL AREA			
LAND USE NATURAL FAIR COVE		) (INCH/	HR) (DECIMAL) CN	(MIN.)
"OPEN BRUSH"	A 9.1	9 N	86 1 000 46	18 84
	ERVIOUS LOSS RATE, Fp(			10.01
	ERVIOUS AREA FRACTION,			
SUBAREA RUNOFF (CFS	s) = 13.61	-		
TOTAL AREA (ACRES)	= 9.19 PEAK FL	OW RATE (C	FS) = 13.61	
	AGED RAINFALL DEPTH(IN 0.95; 1HR = 1.25; 3HR		HR = 3.25; 24HR =	7.50
******	*******	******	******	*****
	NODE 10201.00 TO NOD			
>>>>TRAVELTIME TH	EZOIDAL CHANNEL FLOW<< HRU SUBAREA (EXISTING	ELEMENT) <		
CHANNEL LENGTH THE	PSTREAM(FEET) = 2040 RU SUBAREA(FEET) = 3	30.73 C	HANNEL SLOPE = 0.	
	) = 0.00 "Z" FACT			
	= 0.045 MAXIMUM DEPT SUBAREA(CFS) = 1		1.00	
CHANNEL FLOW INKU	DUDANEM (CFS) - 1	J. UI		
Data: 04/01/0	014 File name: 1 0014	)277 DEC	D	. 2
Date: 04/21/2	014 File name: LR010	JZZZ.KES	Page	2

```
FLOW VELOCITY (FEET/SEC.) = 1.90 FLOW DEPTH (FEET) = 0.38
 TRAVEL TIME (MIN.) = 2.90 Tc (MIN.) = 21.74
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10202.00 = 977.31 FEET.
*****************
 FLOW PROCESS FROM NODE 10202.00 TO NODE 10202.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                            5.78 0.86 1.000 46
 "OPEN BRUSH"
                     A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.78 SUBAREA RUNOFF(CFS) = 7.48
 EFFECTIVE AREA(ACRES) = 14.97 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 15.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*****
 FLOW PROCESS FROM NODE 10202.00 TO NODE 10203.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2030.00 DOWNSTREAM(FEET) = 2021.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 552.98 CHANNEL SLOPE = 0.0163
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              19.38
 FLOW VELOCITY (FEET/SEC.) = 1.65 FLOW DEPTH (FEET) = 0.49
 TRAVEL TIME (MIN.) = 5.60 Tc (MIN.) = 27.34
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10203.00 = 1530.29 FEET.
******************
 FLOW PROCESS FROM NODE 10203.00 TO NODE 10203.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 27.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.003
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     A
                             4.76
                                     0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 4.76
                            SUBAREA RUNOFF (CFS) = 4.90
 EFFECTIVE AREA(ACRES) = 19.73 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
```

Date: 04/21/2014 File name: LR0102ZZ.RES

```
TOTAL AREA (ACRES) = 19.7 PEAK FLOW RATE (CFS) =
                                                20.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
FLOW PROCESS FROM NODE 10203.00 TO NODE 10204.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2021.00 DOWNSTREAM(FEET) = 2000.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 449.80 CHANNEL SLOPE = 0.0467
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.45 FLOW DEPTH (FEET) = 0.41
 TRAVEL TIME (MIN.) = 3.06 Tc (MIN.) = 30.40
 LONGEST FLOWPATH FROM NODE 10200.00 TO NODE 10204.00 = 1980.09 FEET.
*******************
 FLOW PROCESS FROM NODE 10204.00 TO NODE 10204.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 30.40
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.880
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                         8.23 0.86 1.000
                   A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 8.23 SUBAREA RUNOFF (CFS) = 7.55
 EFFECTIVE AREA(ACRES) = 27.96 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 28.0 PEAK FLOW RATE (CFS) = 25.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 28.0 TC (MIN.) =
 EFFECTIVE AREA(ACRES) = 27.96 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.000
 PEAK FLOW RATE (CFS) = 25.66
 END OF RATIONAL METHOD ANALYSIS
```

Page 3 Date: 04/21/2014 File name: LR0102ZZ.RES Page 4

Date: 04/21/2014 File name: LR0102ZZ.RES Page 5 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 10307 (FILE LR0103ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0103ZZ.DAT

TIME/DATE OF STUDY: 14:26 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSEALL. CURR GUTTER-GEOMETRIES. MANNING

	UALL-	CROWN IO	SIKEEI-CKOSSFALL:	CUKD	GOIIEK.	-GEOMETI	ZIEO:	MAMMING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR	
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====	=======	==========	=====	=====	=====	=====	======	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0313	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0313	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

```
18 26.0
           15.0
                  0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0
           20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
  2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
  WATERSHED LAG = 0.80 * Tc
        S-GRAPH TYPE
                                PERCENTAGE (DECIMAL)
                                   1.000
      VALLEY (DEVELOPED)
       FOOTHILL
                                    0.000
       MOUNTAIN
                                    0.000
       VALLEY (UNDEVELOPED) / DESERT
                                    0.000
       DESERT (UNDEVELOPED)
                                    0.000
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
*******************
 FLOW PROCESS FROM NODE 10300.00 TO NODE 10301.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 759.51
 ELEVATION DATA: UPSTREAM(FEET) = 2005.00 DOWNSTREAM(FEET) = 1985.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 20.745
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.364
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                              αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 NATURAL FAIR COVER
                     A 9.83 0.86 1.000
 "OPEN BRUSH"
                                                    46 20.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 13.31
 TOTAL AREA (ACRES) = 9.83 PEAK FLOW RATE (CFS) = 13.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.53; 6HR = 2.22; 24HR = 4.65
******************
 FLOW PROCESS FROM NODE 10301.00 TO NODE 10302.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1985.00 DOWNSTREAM(FEET) = 1960.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 549.34 CHANNEL SLOPE = 0.0455
       Date: 04/21/2014
                      File name: LR0103ZZ.RES
                                                    Page 2
```

10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0

Date: 04/21/2014 File name: LR0103ZZ.RES Page 1

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             13.31
 FLOW VELOCITY (FEET/SEC.) = 2.20 FLOW DEPTH (FEET) = 0.35
 TRAVEL TIME (MIN.) = 4.17 Tc (MIN.) = 24.91
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10302.00 = 1308.85 FEET.
******************
 FLOW PROCESS FROM NODE 10302.00 TO NODE 10302.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 24.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.118
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Аp
                                                  SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 9.20 0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 9.20 SUBAREA RUNOFF (CFS) = 10.42
 EFFECTIVE AREA(ACRES) = 19.03 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 19.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 10302.00 TO NODE 10303.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1942.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 429.95 CHANNEL SLOPE = 0.0419
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.39 FLOW DEPTH (FEET) = 0.42
 TRAVEL TIME (MIN.) = 2.99 Tc (MIN.) = 27.91
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10303.00 = 1738.80 FEET.
******************
 FLOW PROCESS FROM NODE 10303.00 TO NODE 10303.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 27.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.979
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                          αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A
                           12.70
                                   0.86
                                          1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
```

```
SUBAREA AREA (ACRES) = 12.70 SUBAREA RUNOFF (CFS) = 12.79
 EFFECTIVE AREA(ACRES) = 31.73 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 31.7
                              PEAK FLOW RATE(CFS) =
                                                    31.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 10303.00 TO NODE 10304.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1942.00 DOWNSTREAM(FEET) = 1924.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 553.03 CHANNEL SLOPE = 0.0325
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 31.94
 FLOW VELOCITY (FEET/SEC.) = 2.42 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 3.81 Tc (MIN.) = 31.72
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10304.00 = 2291.83 FEET.
**********************
 FLOW PROCESS FROM NODE 10304.00 TO NODE 10304.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 31.72
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.832
 SUBAREA LOSS RATE DATA (AMC II):
                  SCS SOIL AREA
  DEVELOPMENT TYPE/
                                  Fр
                                            Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 19.60 0.86
                                           1.000
                                                    46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                           0.90
                                     0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.982
 SUBAREA AREA (ACRES) = 20.50 SUBAREA RUNOFF (CFS) = 18.16
 EFFECTIVE AREA(ACRES) = 52.23 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 52.2 PEAK FLOW RATE (CFS) =
                                                 45.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.23; 6HR = 3.21; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 10304.00 TO NODE 10305.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1924.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 851.00 CHANNEL SLOPE = 0.0400
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

Date: 04/21/2014 File name: LR0103ZZ.RES

Page 4

Date: 04/21/2014 File name: LR0103ZZ.RES Page 3

```
FLOW VELOCITY (FEET/SEC.) = 2.85 FLOW DEPTH (FEET) = 0.57
 TRAVEL TIME (MIN.) = 4.97 Tc (MIN.) = 36.69
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10305.00 = 3142.83 FEET.
*****************
 FLOW PROCESS FROM NODE 10305.00 TO NODE 10305.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 36.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.679
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                Fр
                                        Ар
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   A 37.64
                                0.86
                                         1.000
                                               46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.29 0.98
                                        0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.977
 SUBAREA AREA(ACRES) = 39.93
                        SUBAREA RUNOFF (CFS) = 30.00
 EFFECTIVE AREA(ACRES) = 92.16 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 92.2 PEAK FLOW RATE (CFS) = 68.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.06; 6HR = 2.83; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 10305.00 TO NODE 10306.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1875.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 443.54 CHANNEL SLOPE = 0.0338
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.96 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 2.50 Tc (MIN.) = 39.19
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10306.00 = 3586.37 FEET.
******************
 FLOW PROCESS FROM NODE 10306.00 TO NODE 10306.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 39.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.614
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                        αA
                                                SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   A 18.49
                                0.86
                                        1.000 46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.69
                                   0.98
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986
 SUBAREA AREA(ACRES) = 19.18
                            SUBAREA RUNOFF (CFS) = 13.18
 EFFECTIVE AREA(ACRES) = 111.34 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 111.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 10306.00 TO NODE 10307.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1875.00 DOWNSTREAM(FEET) = 1863.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 550.37 CHANNEL SLOPE = 0.0218
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              76.50
 FLOW VELOCITY (FEET/SEC.) = 2.60 FLOW DEPTH (FEET) = 0.77
 TRAVEL TIME (MIN.) = 3.53 Tc (MIN.) = 42.73
 LONGEST FLOWPATH FROM NODE 10300.00 TO NODE 10307.00 = 4136.74 FEET.
******************
 FLOW PROCESS FROM NODE 10307.00 TO NODE 10307.00 IS CODE = 81
-----
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 42.73
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.532
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 14.75 0.86 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 14.75
                            SUBAREA RUNOFF (CFS) = 8.93
 EFFECTIVE AREA(ACRES) = 126.09 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 126.1
                             PEAK FLOW RATE(CFS) =
                                                  77.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 126.1 TC (MIN.) = 42.73
 EFFECTIVE AREA(ACRES) = 126.09 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.988
 PEAK FLOW RATE (CFS) = 77.27
______
 END OF RATIONAL METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0103ZZ.RES Page 5 Date: 04/21/2014 File name: LR0103ZZ.RES Page 6

Date: 04/21/2014 File name: LR0103ZZ.RES Page 7 \*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10410 (FILE LR0104ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0104ZZ.DAT

TIME/DATE OF STUDY: 14:26 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

# --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSPALL. CURR GUTTER-GEOMETRIES. MANNING

	UALL-	CROWN 10	SIKEEI-CKOSSFALL:	CUKD	GOIIEK-	-GEOMETI	ZIED:	MAININING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	===========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

```
18 26.0
           15.0
                  0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0
           20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
  2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
  WATERSHED LAG = 0.80 * Tc
        S-GRAPH TYPE
                                PERCENTAGE (DECIMAL)
                                   1.000
      VALLEY (DEVELOPED)
       FOOTHILL
                                    0.000
       MOUNTAIN
                                    0.000
       VALLEY (UNDEVELOPED) / DESERT
                                    0.000
       DESERT (UNDEVELOPED)
                                    0.000
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
*******************
 FLOW PROCESS FROM NODE 10400.00 TO NODE 10401.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 828.35
 ELEVATION DATA: UPSTREAM(FEET) = 1860.00 DOWNSTREAM(FEET) = 1818.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 18.840
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.505
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                              αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
                     A 8.78 0.86 1.000
 "OPEN BRUSH"
                                                    46 18.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 13.00
 TOTAL AREA (ACRES) = 8.78 PEAK FLOW RATE (CFS) = 13.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.98
******************
 FLOW PROCESS FROM NODE 10401.00 TO NODE 10402.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1818.00 DOWNSTREAM(FEET) = 1793.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 735.56 CHANNEL SLOPE = 0.0340
       Date: 04/21/2014
                       File name: LR0104ZZ.RES
                                                    Page 2
```

10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 13.00
 FLOW VELOCITY (FEET/SEC.) = 1.97 FLOW DEPTH (FEET) = 0.36
 TRAVEL TIME (MIN.) = 6.23 Tc (MIN.) = 25.07
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10402.00 = 1563.91 FEET.
*******************
 FLOW PROCESS FROM NODE 10402.00 TO NODE 10402.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 25.07
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.110
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           Ар
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 11.93 0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 11.93 SUBAREA RUNOFF (CFS) = 13.42
 EFFECTIVE AREA(ACRES) = 20.71 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 20.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10402.00 TO NODE 10403.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1793.00 DOWNSTREAM(FEET) = 1773.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 480.31 CHANNEL SLOPE = 0.0416
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.43 FLOW DEPTH (FEET) = 0.44
 TRAVEL TIME (MIN.) = 3.29 Tc (MIN.) = 28.36
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10403.00 = 2044.22 FEET.
******************
 FLOW PROCESS FROM NODE 10403.00 TO NODE 10403.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 28.36
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.960
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Дp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                                           1.000
 "OPEN BRUSH"
                     A
                            9.28
                                     0.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
```

```
SUBAREA AREA(ACRES) = 9.28
                            SUBAREA RUNOFF(CFS) = 9.18
 EFFECTIVE AREA(ACRES) = 29.99 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 30.0
                              PEAK FLOW RATE(CFS) =
                                                   29.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 10403.00 TO NODE 10404.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1773.00 DOWNSTREAM(FEET) = 1753.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 469.46 CHANNEL SLOPE = 0.0426
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             29.68
 FLOW VELOCITY (FEET/SEC.) = 2.62 FLOW DEPTH (FEET) = 0.48
 TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 31.34
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10404.00 = 2513.68 FEET.
**********************
 FLOW PROCESS FROM NODE 10404.00 TO NODE 10404.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 31.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.846
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                  Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           9.33 0.86 1.000
                    A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 9.33 SUBAREA RUNOFF(CFS) = 8.28
 EFFECTIVE AREA(ACRES) = 39.32 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 39.3 PEAK FLOW RATE (CFS) =
                                                   34.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 10404.00 TO NODE 10405.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1753.00 DOWNSTREAM(FEET) = 1726.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 650.38 CHANNEL SLOPE = 0.0415
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              34.88
 FLOW VELOCITY (FEET/SEC.) = 2.70 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 4.02 Tc (MIN.) = 35.36
```

Date: 04/21/2014 File name: LR0104ZZ.RES Page 3

Date: 04/21/2014 File name: LR0104ZZ.RES

```
LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10405.00 = 3164.06 FEET.
********************
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10405.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 35.36
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
             A 16.37
                                  0.86 1.000 46
 "OPEN BRUSH"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 16.37
                             SUBAREA RUNOFF (CFS) = 12.62
 EFFECTIVE AREA(ACRES) = 55.69 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) =
                  55.7
                             PEAK FLOW RATE(CFS) =
                                                    42.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*****************
 FLOW PROCESS FROM NODE 10405.00 TO NODE 10406.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1726.00 DOWNSTREAM(FEET) = 1710.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 615.88 CHANNEL SLOPE = 0.0260
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.39 FLOW DEPTH (FEET) = 0.60
 TRAVEL TIME (MIN.) = 4.30 Tc (MIN.) = 39.66
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10406.00 = 3779.94 FEET.
*********************
 FLOW PROCESS FROM NODE 10406.00 TO NODE 10406.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 39.66
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.602
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Aр
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            17.25
                                     0.86
                                          1.000 46
                    A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 17.25
                             SUBAREA RUNOFF (CFS) = 11.53
 EFFECTIVE AREA(ACRES) = 72.94 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 72.9 PEAK FLOW RATE (CFS) =
                                                   48.74
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
**************************
 FLOW PROCESS FROM NODE 10406.00 TO NODE 10407.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1710.00 DOWNSTREAM(FEET) = 1687.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 591.31 CHANNEL SLOPE = 0.0389
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 75.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             48.74
 FLOW VELOCITY (FEET/SEC.) = 2.59 FLOW DEPTH (FEET) = 0.50
 TRAVEL TIME (MIN.) = 3.80 Tc (MIN.) = 43.46
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10407.00 = 4371.25 FEET.
******************
 FLOW PROCESS FROM NODE 10407.00 TO NODE 10407.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 43.46
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.517
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                   Fρ
                                            Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    Α
                         14.87
                                    0.86
                                          1.000
                           3.24 0.98
                                           0.850
 PUBLIC PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.973
 SUBAREA AREA(ACRES) = 18.11
                           SUBAREA RUNOFF (CFS) = 10.80
 EFFECTIVE AREA(ACRES) = 91.05 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 91.1
                             PEAK FLOW RATE(CFS) =
                                                   53.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10407.00 TO NODE 10408.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1687.00 DOWNSTREAM(FEET) = 1665.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 835.50 CHANNEL SLOPE = 0.0263
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 75.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             53.92
 FLOW VELOCITY (FEET/SEC.) = 2.29 FLOW DEPTH (FEET) = 0.56
 TRAVEL TIME (MIN.) = 6.07 Tc (MIN.) = 49.53
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10408.00 = 5206.75 FEET.
******************
 FLOW PROCESS FROM NODE 10408.00 TO NODE 10408.00 IS CODE = 81
```

Date: 04/21/2014 File name: LR0104ZZ.RES Page 5 Date: 04/21/2014 File name: LR0104ZZ.RES

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 49.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.402
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           qΑ
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                     0.86 1.000 46
 "OPEN BRUSH"
                     A
                             4.54
 PUBLIC PARK
                     Α
                            15.25
                                     0.98 0.850 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.95
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884
                             SUBAREA RUNOFF (CFS) = 10.09
 SUBAREA AREA(ACRES) = 19.79
 EFFECTIVE AREA(ACRES) = 110.84 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 110.8 PEAK FLOW RATE(CFS) =
                                                    54.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 10408.00 TO NODE 10409.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1620.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1131.00 CHANNEL SLOPE = 0.0398
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 30.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.37 FLOW DEPTH (FEET) = 0.74
 TRAVEL TIME (MIN.) = 5.60 Tc (MIN.) = 55.13
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10409.00 = 6337.75 FEET.
********************
 FLOW PROCESS FROM NODE 10409.00 TO NODE 10409.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 55.13
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.315
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                           Ар
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                           1.000 46
 "OPEN BRUSH"
                      Α
                             12.14
                                     0.86
 PUBLIC PARK
                     A
                             21.33
                                     0.98
                                            0.850 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.904
 SUBAREA AREA(ACRES) = 33.47
                           SUBAREA RUNOFF(CFS) = 14.31
 EFFECTIVE AREA(ACRES) = 144.31 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.96
 TOTAL AREA(ACRES) = 144.3 PEAK FLOW RATE(CFS) =
                                                 60.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
```

```
FLOW PROCESS FROM NODE 10409.00 TO NODE 10410.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1622.08 CHANNEL SLOPE = 0.0247
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 20.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             60.24
 FLOW VELOCITY (FEET/SEC.) = 3.19 FLOW DEPTH (FEET) = 0.97
 TRAVEL TIME (MIN.) = 8.48 Tc (MIN.) = 63.60
 LONGEST FLOWPATH FROM NODE 10400.00 TO NODE 10410.00 = 7959.83 FEET.
******************
 FLOW PROCESS FROM NODE 10410.00 TO NODE 10410.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 63.60
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.207
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 29.91 0.86 1.000
                                                  46
                    A 12.31 0.98 0.850
 PUBLIC PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.956
 SUBAREA AREA (ACRES) = 42.22
                            SUBAREA RUNOFF (CFS) = 13.53
 EFFECTIVE AREA(ACRES) = 186.53 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.96
 TOTAL AREA (ACRES) = 186.5
                              PEAK FLOW RATE (CFS) =
                                                   60.24
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) =
                     186.5 TC(MIN.) = 63.60
 EFFECTIVE AREA(ACRES) = 186.53 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp (INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.958
 PEAK FLOW RATE(CFS) =
                       60.24
______
 END OF RATIONAL METHOD ANALYSIS
```

\*

Date: 04/21/2014 File name: LR0104ZZ.RES Page 7 Date: 04/21/2014 File name: LR0104ZZ.RES Page 8

Date: 04/21/2014 File name: LR0104ZZ.RES Page 9 \*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

### Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10543 (FILE LR0105ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*

FILE NAME: LR0105ZZ.DAT

TIME/DATE OF STUDY: 14:26 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312		0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc S-GRAPH TYPE PERCENTAGE (DECIMAL) 1.000 VALLEY (DEVELOPED) FOOTHILL 0.000 MOUNTAIN 0.000 VALLEY (UNDEVELOPED) / DESERT 0.000 DESERT (UNDEVELOPED) 0.000 PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 10500.00 TO NODE 10501.00 IS CODE = 21 \_\_\_\_\_\_ >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 849.43 ELEVATION DATA: UPSTREAM(FEET) = 1880.00 DOWNSTREAM(FEET) = 1878.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 20.520 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.380 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) NATURAL FAIR COVER A 5.34 0.86 1.000 46 35.16 "OPEN BRUSH" RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.62 0.98 0.600 32 20.52 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958 SUBAREA RUNOFF (CFS) = 8.30 TOTAL AREA (ACRES) = 5.96 PEAK FLOW RATE (CFS) = 8.30 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 10501.00 TO NODE 10502.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> File name: LR0105ZZ.RES Date: 04/21/2014 Page 2

```
ELEVATION DATA: UPSTREAM(FEET) = 1878.00 DOWNSTREAM(FEET) = 1868.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 586.30 CHANNEL SLOPE = 0.0171
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              8.30
 FLOW VELOCITY (FEET/SEC.) = 1.37 FLOW DEPTH (FEET) = 0.35
 TRAVEL TIME (MIN.) = 7.13 Tc (MIN.) = 27.65
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10502.00 = 1435.73 FEET.
*****************
 FLOW PROCESS FROM NODE 10502.00 TO NODE 10502.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 27.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.990
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                  SCS
     LAND USE
             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                          5.15 0.86 1.000 46
                    A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.15 SUBAREA RUNOFF(CFS) = 5.24
 EFFECTIVE AREA(ACRES) = 11.11 AREA-AVERAGED Fm(INCH/HR) = 0.84
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) = 11.1 PEAK FLOW RATE (CFS) =
                                                  11.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*****************
 FLOW PROCESS FROM NODE 10502.00 TO NODE 10503.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1868.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 431.55 CHANNEL SLOPE = 0.0417
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             11.45
 FLOW VELOCITY (FEET/SEC.) = 2.07 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 3.48 Tc (MIN.) = 31.13
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10503.00 = 1867.28 FEET.
******************
 FLOW PROCESS FROM NODE 10503.00 TO NODE 10503.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 31.13
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.853
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            αA
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            15.29
                                    0.86
                                           1.000 46
```

```
RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.84 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.979
 SUBAREA AREA (ACRES) = 16.13 SUBAREA RUNOFF (CFS) = 14.63
 EFFECTIVE AREA(ACRES) = 27.24 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) = 27.2
                             PEAK FLOW RATE(CFS) =
                                                  24.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
************************
 FLOW PROCESS FROM NODE 10503.00 TO NODE 10504.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1850.00 DOWNSTREAM(FEET) = 1835.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 418.00 CHANNEL SLOPE = 0.0359
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           24.71
 FLOW VELOCITY (FEET/SEC.) = 2.33 FLOW DEPTH (FEET) = 0.46
 TRAVEL TIME (MIN.) = 2.99 Tc (MIN.) = 34.12
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10504.00 = 2285.28 FEET.
******************
 FLOW PROCESS FROM NODE 10504.00 TO NODE 10504.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 34.12
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.754
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                            Aρ
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 15.52
                                    0.86
                                          1.000
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.80
                                    0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.980
 SUBAREA AREA(ACRES) = 16.32
                            SUBAREA RUNOFF (CFS) = 13.33
 EFFECTIVE AREA(ACRES) = 43.56 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) = 43.6
                             PEAK FLOW RATE(CFS) =
                                                  35.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.67
FLOW PROCESS FROM NODE 10504.00 TO NODE 10505.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1835.00 DOWNSTREAM(FEET) = 1815.00
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 3 Date: 04/21/2014 File name: LR0105ZZ.RES

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 671.56 CHANNEL SLOPE = 0.0298
                                                                          "OPEN BRUSH"
                                                                                             A 20.76
                                                                                                              0.86 1.000
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                               A 0.75
                                                                                                              0.98
                                                                                                                     0.100
                                                                          COMMERCIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                          RESIDENTIAL
                                                                                                              0.98 0.600
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                             A
                                                                                                    1.73
 FLOW VELOCITY (FEET/SEC.) = 2.40 FLOW DEPTH (FEET) = 0.54
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
 TRAVEL TIME (MIN.) = 4.66 Tc (MIN.) = 38.78
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.941
                                                                          SUBAREA AREA(ACRES) = 23.24
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10505.00 = 2956.84 FEET.
                                                                                                     SUBAREA RUNOFF (CFS) = 15.03
                                                                          EFFECTIVE AREA(ACRES) = 93.00 AREA-AVERAGED Fm(INCH/HR) = 0.84
AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.97
 FLOW PROCESS FROM NODE 10505.00 TO NODE 10505.00 IS CODE = 81
                                                                          TOTAL AREA (ACRES) = 93.0
                                                                                                       PEAK FLOW RATE (CFS) =
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 MAINLINE Tc(MIN.) = 38.78
                                                                         *******************
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.624
                                                                          FLOW PROCESS FROM NODE 10506.00 TO NODE 10507.00 IS CODE = 54
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                         ______
                                  Fρ
                                            Αр
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 NATURAL FAIR COVER
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 "OPEN BRUSH"
                    A 25.05
                                     0.86
                                            1.000
                                                                        46
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1792.00 DOWNSTREAM(FEET) = 1765.00
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.15
                                     0.98
                                            0.600
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 726.03 CHANNEL SLOPE = 0.0372
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.982
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 SUBAREA AREA(ACRES) = 26.20
                            SUBAREA RUNOFF (CFS) = 18.30
                                                                          CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                       58.16
 EFFECTIVE AREA(ACRES) = 69.76 AREA-AVERAGED Fm(INCH/HR) = 0.85
                                                                          FLOW VELOCITY (FEET/SEC.) = 2.95 FLOW DEPTH (FEET) = 0.63
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.98
                                                                          TRAVEL TIME (MIN.) = 4.11 Tc (MIN.) = 46.78
 TOTAL AREA (ACRES) = 69.8 PEAK FLOW RATE (CFS) =
                                                   48.82
                                                                          LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10507.00 = 4333.51 FEET.
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                          FLOW PROCESS FROM NODE 10507.00 TO NODE 10507.00 IS CODE = 81
********************
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 FLOW PROCESS FROM NODE 10505.00 TO NODE 10506.00 IS CODE = 54
                                                                         ______
                                                                          MAINLINE Tc (MIN.) = 46.78
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.451
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                          SUBAREA LOSS RATE DATA (AMC II):
_____
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                    αA
 ELEVATION DATA: UPSTREAM(FEET) = 1815.00 DOWNSTREAM(FEET) = 1792.00
                                                                              LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 650.64 CHANNEL SLOPE = 0.0353
                                                                          NATURAL FAIR COVER
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          "OPEN BRUSH"
                                                                                             A
                                                                                                    2.43
                                                                                                              0.86
                                                                                                                    1.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                          COMMERCIAL
                                                                                              A 22.73
                                                                                                              0.98
                                                                                                                     0.100
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             48.82
                                                                          RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 2.78 FLOW DEPTH (FEET) = 0.59
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                             A 0.79
                                                                                                              0.98
                                                                                                                     0.600
 TRAVEL TIME (MIN.) = 3.90 Tc (MIN.) = 42.67
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.92
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10506.00 = 3607.48 FEET.
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.199
                                                                                                   SUBAREA RUNOFF(CFS) = 29.60
                                                                          SUBAREA AREA(ACRES) = 25.95
******************
                                                                          EFFECTIVE AREA(ACRES) = 118.95 AREA-AVERAGED Fm(INCH/HR) = 0.70
 FLOW PROCESS FROM NODE 10506.00 TO NODE 10506.00 IS CODE = 81
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.80
                                                                          TOTAL AREA(ACRES) = 118.9 PEAK FLOW RATE(CFS) =
                                                                                                                          80.88
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 MAINLINE Tc (MIN.) = 42.67
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.534
                                                                         SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                          FLOW PROCESS FROM NODE 10507.00 TO NODE 10508.00 IS CODE = 54
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 5 Date: 04/21/2014 File name: LR010577.RFS

46

32

58.16

SCS

32

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1735.00 DOWNSTREAM ELEVATION(FEET) = 1720.00
 STREET LENGTH (FEET) = 760.94 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.96
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 36.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.02
 STREET FLOW TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 51.57
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.369
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 142.92 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 142.9 PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 36.31
 FLOW VELOCITY (FEET/SEC.) = 5.18 DEPTH*VELOCITY (FT*FT/SEC.) = 4.02
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 31.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.68
 PIPE-FLOW(CFS) = 103.81
 PIPEFLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 49.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.395
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 TOTAL AREA(ACRES) = 142.9
                                  PEAK FLOW RATE (CFS) = 103.81
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.00
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10510.00 = 5719.16 FEET.
*******************
 FLOW PROCESS FROM NODE 10510.00 TO NODE 10511.00 IS CODE = 63
```

File name: LR0105ZZ.RES

Page 8

Date: 04/21/2014

Date: 04/21/2014 File name: LR0105ZZ.RES Page 7

```
PIPE-FLOW VELOCITY (FEET/SEC.) = 15.34
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    PIPE-FLOW(CFS) = 103.81
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 2.26 Tc (MIN.) = 52.24
_____
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.358
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1675.00
                                                                                    SUBAREA AREA (ACRES) = 102.15 SUBAREA RUNOFF (CFS) = 76.58
 STREET LENGTH (FEET) = 2077.22 CURB HEIGHT (INCHES) = 6.0
                                                                                    TOTAL AREA(ACRES) = 245.1
                                                                                                                   PEAK FLOW RATE (CFS) = 173.55
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    5M = 0.30; 30M = 0.62; 1HR = 0.82; 3HR = 1.37; 6HR = 1.90; 24HR = 4.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 69.74
                                                                                      ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     STREET FLOW DEPTH (FEET) = 0.63
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 24.60
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.43
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.43
                                                                                    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                        AND L = 2077.2 FT WITH ELEVATION-DROP = 45.0 FT, IS 228.2 CFS,
   ***STREET FLOWING FULL***
                                                                                          WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10511.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10511.00 = 7796.38 FEET.
   STREET FLOW DEPTH (FEET) = 0.78
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 32.17
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.53
                                                                                    FLOW PROCESS FROM NODE 10511.00 TO NODE 10512.00 IS CODE = 63
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.12
                                                                                   ______
 STREET FLOW TRAVEL TIME (MIN.) = 5.30 Tc (MIN.) = 55.29
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.313
                                                                                    >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  _____
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                    UPSTREAM ELEVATION(FEET) = 1675.00 DOWNSTREAM ELEVATION(FEET) = 1620.00
                                         Fρ
                                                         SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    STREET LENGTH (FEET) = 1732.03 CURB HEIGHT (INCHES) = 6.0
 RESIDENTIAL
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 "3-4 DWELLINGS/ACRE"
                      A
                               81.84
                                          0.98
                                                  0.600
                                                        32
                                12.29
                                                  0.250 32
 MOBILE HOME PARK
                        Α
                                          0.98
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                  0.250 56
 MOBILE HOME PARK
                       В
                               2.67
                                          0.75
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RESIDENTIAL
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE"
                         В
                                 2.19
                                          0.75
                                                  0.600 56
                                 2.03
                                          0.98
                                                  0.600
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SCHOOL
                         A
 COMMERCIAL
                        Α
                                 1.13
                                          0.98
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.543
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA (ACRES) = 102.15 SUBAREA RUNOFF (CFS) = 72.42
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 EFFECTIVE AREA(ACRES) = 245.07 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.63
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                       209.25
 TOTAL AREA(ACRES) = 245.1
                                PEAK FLOW RATE (CFS) = 163.55
                                                                                      ***STREET FLOWING FULL***
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     STREET FLOW DEPTH (FEET) = 0.84
 5M = 0.30; 30M = 0.62; 1HR = 0.82; 3HR = 1.37; 6HR = 1.90; 24HR = 4.00
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 34.98
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.30
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.97
 DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 34.25
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 3.48 Tc (MIN.) = 55.72
 FLOW VELOCITY (FEET/SEC.) = 6.76 DEPTH*VELOCITY (FT*FT/SEC.) = 5.58
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.307
```

THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70	LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:	RESIDENTIAL					
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **	"3-4 DWELLINGS/ACRE"	A	77.30	0.98	0.600	32
ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1	MOBILE HOME PARK	A	17.32	0.98	0.250	32
DEPTH OF FLOW IN 39.0 INCH PIPE IS 29.7 INCHES	COMMERCIAL	A	4.24	0.98	0.100	32

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA

SCS

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                                       Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.517
                                                                                       Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA(ACRES) = 98.86
                               SUBAREA RUNOFF(CFS) = 71.40
                                                                                       MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 EFFECTIVE AREA(ACRES) = 343.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.60
                                                                                         **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TOTAL AREA (ACRES) = 343.9 PEAK FLOW RATE (CFS) = 233.58
                                                                                         ***STREET FLOWING FULL***
                                                                                         STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                         STREET FLOW DEPTH (FEET) = 1.07
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                         HALFSTREET FLOOD WIDTH (FEET) = 46.58
                                                                                        AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.77
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                         PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 6.18
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.51
                                                                                       STREET FLOW TRAVEL TIME (MIN.) = 7.04 Tc (MIN.) = 61.15
 FLOW VELOCITY (FEET/SEC.) = 8.53 DEPTH*VELOCITY (FT*FT/SEC.) = 7.42
                                                                                       * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.236
                                                                                       SUBAREA LOSS RATE DATA (AMC II):
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                       DEVELOPMENT TYPE/
                                                                                                          SCS SOIL AREA
                                                                                                                              Fp
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
                                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                           LAND USE
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                       COMMERCIAL
                                                                                                             A
                                                                                                                      3.47 0.98 0.100
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                       RESIDENTIAL
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                       "3-4 DWELLINGS/ACRE" A 28.29 0.98 0.600
 ASSUME FULL-FLOWING PIPELINE
                                                                                       AGRICULTURAL FAIR COVER
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.49
                                                                                       "ORCHARDS"
                                                                                                                    22.79 0.88 1.000 44
                                                                                                               Α
 PIPE-FLOW(CFS) = 109.58
                                                                                       SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.92
 PIPEFLOW TRAVEL TIME (MIN.) = 1.86 Tc (MIN.) = 54.11
                                                                                       SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.735
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.330
                                                                                       SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 27.42
 SUBAREA AREA (ACRES) = 98.86 SUBAREA RUNOFF (CFS) = 73.46
                                                                                       EFFECTIVE AREA(ACRES) = 398.48 AREA-AVERAGED Fm(INCH/HR) = 0.57
 TOTAL AREA(ACRES) = 343.9 PEAK FLOW RATE(CFS) = 240.78
                                                                                       AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.62
                                                                                       TOTAL AREA (ACRES) = 398.5
                                                                                                                         PEAK FLOW RATE (CFS) = 240.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                       SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 131.20
                                                                                       5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       END OF SUBAREA STREET FLOW HYDRAULICS:
   STREET FLOW DEPTH (FEET) = 0.72
                                                                                       DEPTH(FEET) = 1.05 HALFSTREET FLOOD WIDTH(FEET) = 45.54
   HALFSTREET FLOOD WIDTH (FEET) = 29.12
                                                                                       FLOW VELOCITY (FEET/SEC.) = 5.70 DEPTH*VELOCITY (FT*FT/SEC.) = 5.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.42
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.36
                                                                                       *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                             THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
       AND L = 1732.0 FT WITH ELEVATION-DROP = 55.0 FT, IS 247.7 CFS,
                                                                                       SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10512.00
                                                                                       ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10512.00 = 9528.41 FEET.
                                                                                       ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
                                                                                       ASSUME FULL-FLOWING PIPELINE
*******************
                                                                                       PIPE-FLOW VELOCITY(FEET/SEC.) = 10.61
 FLOW PROCESS FROM NODE 10512.00 TO NODE 10513.00 IS CODE = 63
                                                                                       PIPE-FLOW(CFS) = 117.33
                                                                                       PIPEFLOW TRAVEL TIME (MIN.) = 3.83 Tc (MIN.) = 57.94
                                                                                       * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.277
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                       SUBAREA AREA(ACRES) = 54.55 SUBAREA RUNOFF(CFS) = 29.42
                                                                                       TOTAL AREA(ACRES) = 398.5 PEAK FLOW RATE(CFS) = 253.65
______
 UPSTREAM ELEVATION(FEET) = 1620.00 DOWNSTREAM ELEVATION(FEET) = 1593.00
 STREET LENGTH (FEET) = 2438.23 CURB HEIGHT (INCHES) = 6.0
                                                                                       SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HALFWIDTH (FEET) = 18.00
                                                                                       5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                       STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                       STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 136.32
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                        ***STREET FLOWING FULL***
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                         STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                         STREET FLOW DEPTH(FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                         HALFSTREET FLOOD WIDTH (FEET) = 36.38
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                         AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.01
```

SCS

32

32

Date: 04/21/2014 File name: LR0105ZZ.RES Page 11 Date: 04/21/2014 File name: LR0105ZZ.RES Page 12

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.35
                                                                                    *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10513.00 = 11966.64 FEET.
                                                                                         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 FLOW PROCESS FROM NODE 10513.00 TO NODE 10514.00 IS CODE = 63
                                                                                   ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
                                                                                   ASSUME FULL-FLOWING PIPELINE
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   PIPE-FLOW VELOCITY(FEET/SEC.) = 10.75
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                    PIPE-FLOW(CFS) = 171.15
_____
                                                                                   PIPEFLOW TRAVEL TIME (MIN.) = 4.00 Tc (MIN.) = 61.94
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.226
 UPSTREAM ELEVATION(FEET) = 1593.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH (FEET) = 2581.60 CURB HEIGHT (INCHES) = 6.0
                                                                                    SUBAREA AREA (ACRES) = 77.42 SUBAREA RUNOFF (CFS) = 49.95
                                                                                   TOTAL AREA (ACRES) = 475.9 PEAK FLOW RATE (CFS) = 285.62
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                   STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 114.48
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     STREET FLOW DEPTH (FEET) = 0.85
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 35.41
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.44
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 277.07
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
   ***STREET FLOWING FULL***
                                                                                         AND L = 2581.6 FT WITH ELEVATION-DROP = 23.0 FT, IS 143.3 CFS,
                                                                                          WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10514.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10514.00 = 14548.24 FEET.
   STREET FLOW DEPTH(FEET) = 1.15
   HALFSTREET FLOOD WIDTH (FEET) = 50.30
                                                                                  *******************
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.19
                                                                                    FLOW PROCESS FROM NODE 10514.00 TO NODE 10543.00 IS CODE = 63
 STREET FLOW TRAVEL TIME (MIN.) = 7.97 Tc (MIN.) = 65.91
                                                                                  ______
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.182
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  ______
                                         Fρ
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1564.00
     LAND USE
 NATURAL FAIR COVER
                                                                                   STREET LENGTH (FEET) = 151.62 CURB HEIGHT (INCHES) = 6.0
                       A 0.39
                                          0.86
                                                1.000 46
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 "OPEN BRUSH"
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 3.30
                                          0.98
                                                  0.600 32
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                30.14
                                          0.98
                                                  0.100
                                                         32
                                                                                   INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 COMMERCIAL
                        A
 PUBLIC PARK
                       A 28.02
                                          0.98
                                                  0.850 32
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                9.10
 SCHOOL
                                          0.98
                                                  0.600
 AGRICULTURAL FAIR COVER
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 "ORCHARDS"
                        A
                              6.47
                                                1.000
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.531
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA(ACRES) = 77.42 SUBAREA RUNOFF(CFS) = 46.83
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 EFFECTIVE AREA(ACRES) = 475.90 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.60
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                      285.62
 TOTAL AREA (ACRES) = 475.9 PEAK FLOW RATE (CFS) = 266.41
                                                                                     ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     STREET FLOW DEPTH(FEET) = 0.90
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 37.85
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.72
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.72
 DEPTH(FEET) = 1.13 HALFSTREET FLOOD WIDTH(FEET) = 49.51
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 62.20
 FLOW VELOCITY (FEET/SEC.) = 5.35 DEPTH*VELOCITY (FT*FT/SEC.) = 6.05
                                                                                    * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223
                                                                                    SUBAREA AREA(ACRES) = 0.00
                                                                                                                  SUBAREA RUNOFF(CFS) = 0.00
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 13 Date: 04/21/2014 File name: LR0105ZZ.RES Page 14

```
EFFECTIVE AREA(ACRES) = 475.90 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 475.9
                                PEAK FLOW RATE (CFS) = 285.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.63; 1HR = 0.84; 3HR = 1.38; 6HR = 1.90; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 37.85
 FLOW VELOCITY (FEET/SEC.) = 9.72 DEPTH*VELOCITY (FT*FT/SEC.) = 8.72
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.16
 PIPE-FLOW(CFS) = 184.53
 PIPEFLOW TRAVEL TIME (MIN.) = 0.13 Tc (MIN.) = 62.07
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.225
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 TOTAL AREA (ACRES) = 475.9 PEAK FLOW RATE (CFS) = 285.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.63; 1HR = 0.84; 3HR = 1.38; 6HR = 1.90; 24HR = 4.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 101.10
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.84
 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10543.00 = 14699.86 FEET.
*******************
 FLOW PROCESS FROM NODE 10543.00 TO NODE 10543.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 10520.00 TO NODE 10521.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 672.38
 ELEVATION DATA: UPSTREAM(FEET) = 1860.00 DOWNSTREAM(FEET) = 1845.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 20.425
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.386
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS Tc
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     A
                           8.38
                                    0.86 1.000 46 20.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 11.51
 TOTAL AREA(ACRES) = 8.38 PEAK FLOW RATE(CFS) = 11.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.13
******************
 FLOW PROCESS FROM NODE 10521.00 TO NODE 10522.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <><<
ELEVATION DATA: UPSTREAM(FEET) = 1845.00 DOWNSTREAM(FEET) = 1830.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 343.12 CHANNEL SLOPE = 0.0437
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 11.51
 FLOW VELOCITY (FEET/SEC.) = 2.08 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 2.75 Tc (MIN.) = 23.18
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10522.00 = 1015.50 FEET.
*************************
 FLOW PROCESS FROM NODE 10522.00 TO NODE 10522.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 23.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.212
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Ар
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A
                          8.15 0.86 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 8.15 SUBAREA RUNOFF (CFS) = 9.92
 EFFECTIVE AREA(ACRES) = 16.53 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 16.5
                             PEAK FLOW RATE(CFS) =
                                                  20.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.51
FLOW PROCESS FROM NODE 10522.00 TO NODE 10523.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1830.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 408.67 CHANNEL SLOPE = 0.0367
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 15

File name: LR0105ZZ.RES

Page 16

Date: 04/21/2014

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                             20.11
 FLOW VELOCITY (FEET/SEC.) = 2.25 FLOW DEPTH (FEET) = 0.42
 TRAVEL TIME (MIN.) = 3.02 Tc (MIN.) = 26.20
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10523.00 = 1424.17 FEET.
FLOW PROCESS FROM NODE 10523.00 TO NODE 10523.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 26.20
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.055
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    A 10.89
                                  0.86 1.000 46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 10.89
                            SUBAREA RUNOFF(CFS) = 11.71
 EFFECTIVE AREA(ACRES) = 27.42 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 27.4
                           PEAK FLOW RATE(CFS) =
                                                  29.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10523.00 TO NODE 10524.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1815.00 DOWNSTREAM(FEET) = 1800.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 285.31 CHANNEL SLOPE = 0.0526
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            29.49
 FLOW VELOCITY (FEET/SEC.) = 2.85 FLOW DEPTH (FEET) = 0.45
 TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 27.87
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10524.00 = 1709.48 FEET.
********************
 FLOW PROCESS FROM NODE 10524.00 TO NODE 10524.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 27.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.980
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                  Fp
                                            Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           15.94
                                  0.86 1.000 46
                    A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 15.94 SUBAREA RUNOFF (CFS) = 16.07
 EFFECTIVE AREA(ACRES) = 43.36 AREA-AVERAGED Fm(INCH/HR) = 0.86
```

```
43.4
                                                  43.72
 TOTAL AREA (ACRES) =
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
**********************
 FLOW PROCESS FROM NODE 10524.00 TO NODE 10525.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1800.00 DOWNSTREAM(FEET) = 1785.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 688.16 CHANNEL SLOPE = 0.0218
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            43.72
 FLOW VELOCITY (FEET/SEC.) = 2.25 FLOW DEPTH (FEET) = 0.62
 TRAVEL TIME (MIN.) = 5.09 Tc (MIN.) = 32.95
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10525.00 = 2397.64 FEET.
******************
 FLOW PROCESS FROM NODE 10525.00 TO NODE 10525.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 32.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.791
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                         αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH" A
                        20.30 0.86 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 20.30 SUBAREA RUNOFF (CFS) = 17.01
 EFFECTIVE AREA(ACRES) = 63.66 AREA-AVERAGED Fm(INCH/HR) = 0.86
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 63.7
                             PEAK FLOW RATE (CFS) =
                                                  53.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10525.00 TO NODE 10526.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1785.00 DOWNSTREAM(FEET) = 1755.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 697.48 CHANNEL SLOPE = 0.0430
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             53.33
 FLOW VELOCITY (FEET/SEC.) = 3.04 FLOW DEPTH (FEET) = 0.59
 TRAVEL TIME (MIN.) = 3.82 Tc (MIN.) = 36.78
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10526.00 = 3095.12 FEET.
```

AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 1.00

Date: 04/21/2014 File name: LR0105ZZ.RES Page 17 Date: 04/21/2014 File name: LR0105ZZ.RES Page 18

```
******************
 FLOW PROCESS FROM NODE 10526.00 TO NODE 10526.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 36.78
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.677
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           23.91
                                         1.000
                    A
                                  0.86
                                                 46
 COMMERCIAL
                    A
                           0.89
                                  0.98 0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968
 SUBAREA AREA(ACRES) = 24.80
                            SUBAREA RUNOFF (CFS) = 18.84
 EFFECTIVE AREA(ACRES) = 88.46 AREA-AVERAGED Fm(INCH/HR) = 0.85
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 88.5 PEAK FLOW RATE (CFS) = 65.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
********************
 FLOW PROCESS FROM NODE 10526.00 TO NODE 10527.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1755.00 DOWNSTREAM(FEET) = 1735.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 505.02 CHANNEL SLOPE = 0.0396
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            65.63
 FLOW VELOCITY (FEET/SEC.) = 3.09 FLOW DEPTH (FEET) = 0.65
 TRAVEL TIME (MIN.) = 2.72 Tc (MIN.) = 39.50
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10527.00 = 3600.14 FEET.
*******************
 FLOW PROCESS FROM NODE 10527.00 TO NODE 10527.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 39.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.606
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          Аp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           15.00
                                    0.86
                                          1.000
                    A
                           8.17
                                           0.100
 COMMERCIAL
                     Α
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 23.17
                            SUBAREA RUNOFF (CFS) = 21.17
 EFFECTIVE AREA(ACRES) = 111.63 AREA-AVERAGED Fm(INCH/HR) = 0.80
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.93
 TOTAL AREA(ACRES) = 111.6 PEAK FLOW RATE(CFS) =
                                                  81.21
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
FLOW PROCESS FROM NODE 10527.00 TO NODE 10528.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1725.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 890.13 CHANNEL SLOPE = 0.0112
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              81.21
 FLOW VELOCITY (FEET/SEC.) = 2.05 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 7.23 Tc (MIN.) = 46.73
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10528.00 = 4490.27 FEET.
******************
 FLOW PROCESS FROM NODE 10528.00 TO NODE 10528.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 46.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.452
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fρ
                                             Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            12.34
                                     0.86
                                            1.000
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                            3.37
                                     0.88
                                           1.000
                      A
                     A
 COMMERCIAL
                             5.75
                                     0.98 0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.759
 SUBAREA AREA(ACRES) = 21.46
                             SUBAREA RUNOFF (CFS) = 15.32
 EFFECTIVE AREA(ACRES) = 133.09 AREA-AVERAGED Fm(INCH/HR) = 0.78
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.90
 TOTAL AREA (ACRES) = 133.1
                              PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10528.00 TO NODE 10529.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1725.00 DOWNSTREAM(FEET) = 1695.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1118.85 CHANNEL SLOPE = 0.0268
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              81.21
 FLOW VELOCITY (FEET/SEC.) = 2.83 FLOW DEPTH (FEET) = 0.76
 TRAVEL TIME (MIN.) = 6.60 Tc (MIN.) = 53.33
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10529.00 = 5609.12 FEET.
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 19

File name: LR0105ZZ.RES

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 10529.00 TO NODE 10529.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 53.33
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.342
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                32
 PUBLIC PARK
                   A
                           4.62
                                   0.98
                                          0.850
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   A
                           2.25
                                   0.86
                                          1.000
                                               46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                          0.84
                                   0.98
                                          0.600
                                                32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                           32.15
                                   0.88
                                        1.000
                    Α
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.974
 SUBAREA AREA(ACRES) = 39.86
                           SUBAREA RUNOFF(CFS) = 17.04
 EFFECTIVE AREA(ACRES) = 172.95 AREA-AVERAGED Fm(INCH/HR) = 0.80
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.92
 TOTAL AREA (ACRES) = 172.9 PEAK FLOW RATE (CFS) = 84.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10529.00 TO NODE 10530.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1695.00 DOWNSTREAM(FEET) = 1660.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1046.42 CHANNEL SLOPE = 0.0334
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            84.83
 FLOW VELOCITY (FEET/SEC.) = 3.12 FLOW DEPTH (FEET) = 0.74
 TRAVEL TIME (MIN.) = 5.59 Tc (MIN.) = 58.91
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10530.00 = 6655.54 FEET.
******************
 FLOW PROCESS FROM NODE 10530.00 TO NODE 10530.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 58.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.264
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                         αA
                                                SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                          18.01
                                          0.850
                                               32
 PUBLIC PARK
                   A
                                   0.98
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                          3.96
                                   0.98
                                          0.600
                                                32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                           53.29
                                   0.88
                                          1.000
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.943
 SUBAREA AREA(ACRES) = 75.26
                           SUBAREA RUNOFF(CFS) = 27.88
 EFFECTIVE AREA(ACRES) = 248.21 AREA-AVERAGED Fm(INCH/HR) = 0.81
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.92
 TOTAL AREA(ACRES) = 248.2
                             PEAK FLOW RATE(CFS) =
                                                 100.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10530.00 TO NODE 10531.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1660.00 DOWNSTREAM(FEET) = 1635.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 766.04 CHANNEL SLOPE = 0.0326
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 75.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             100.59
 FLOW VELOCITY (FEET/SEC.) = 2.88 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 4.43 Tc (MIN.) = 63.34
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10531.00 = 7421.58 FEET.
******************
 FLOW PROCESS FROM NODE 10531.00 TO NODE 10531.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 63.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.210
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                  SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 PUBLIC PARK
                           15.83 0.98
                                          0.850
                                                  32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                          4.11
                                    0.98
                                           0.600
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                            35.99
                                    0.88
                                         1.000
                     A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.91
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.928
                           SUBAREA RUNOFF(CFS) = 18.43
 SUBAREA AREA(ACRES) = 55.93
 EFFECTIVE AREA(ACRES) = 304.14 AREA-AVERAGED Fm(INCH/HR) = 0.82
 AREA-AVERAGED Fp (INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.93
 TOTAL AREA (ACRES) = 304.1 PEAK FLOW RATE (CFS) =
                                                 107.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10531.00 TO NODE 10542.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1635.00 DOWNSTREAM(FEET) = 1610.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 819.03 CHANNEL SLOPE = 0.0305
```

Page 22

Date: 04/21/2014 File name: LR0105ZZ.RES Page 21 Date: 04/21/2014 File name: LR0105ZZ.RES

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 107.01
 FLOW VELOCITY (FEET/SEC.) = 3.19 FLOW DEPTH (FEET) = 0.82
 TRAVEL TIME (MIN.) = 4.28 Tc (MIN.) = 67.62
 LONGEST FLOWPATH FROM NODE 10520.00 TO NODE 10542.00 = 8240.61 FEET.
*****************
 FLOW PROCESS FROM NODE 10542.00 TO NODE 10542.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 67.62
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.163
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fρ
                                         Ap SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
                           22.46
                                    0.98
                                           0.850
 PUBLIC PARK
                    A
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.50
                                    0.98
                                           0.600
                                                32
                            8.47
                                    0.98
                                           0.100
 COMMERCIAL
                   A
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                     A 11.86 0.88
                                         1.000 44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.94
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738
 SUBAREA AREA (ACRES) = 44.29 SUBAREA RUNOFF (CFS) = 18.70
 EFFECTIVE AREA(ACRES) = 348.43 AREA-AVERAGED Fm(INCH/HR) = 0.80
 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.90
 TOTAL AREA(ACRES) = 348.4 PEAK FLOW RATE(CFS) = 112.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*****************
 FLOW PROCESS FROM NODE 10542.00 TO NODE 10542.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 67.62
 RAINFALL INTENSITY (INCH/HR) = 1.16
 AREA-AVERAGED Fm(INCH/HR) = 0.80
 AREA-AVERAGED Fp(INCH/HR) = 0.89
 AREA-AVERAGED Ap = 0.90
 EFFECTIVE STREAM AREA(ACRES) = 348.43
 TOTAL STREAM AREA(ACRES) = 348.43
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 112.97
*****************
 FLOW PROCESS FROM NODE 10540.00 TO NODE 10541.00 IS CODE = 21
._____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 810.53
 ELEVATION DATA: UPSTREAM(FEET) = 1660.00 DOWNSTREAM(FEET) = 1638.00
```

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 21.163
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.336
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                             Αp
                                                   SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      Α
                           4.86 0.88 1.000 44 21.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF (CFS) = 6.37
 TOTAL AREA (ACRES) = 4.86 PEAK FLOW RATE (CFS) =
                                                6.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10541.00 TO NODE 10542.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1638.00 DOWNSTREAM(FEET) = 1610.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2028.76 CHANNEL SLOPE = 0.0138
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              6.37
 FLOW VELOCITY (FEET/SEC.) = 1.56 FLOW DEPTH (FEET) = 0.52
 TRAVEL TIME (MIN.) = 21.67 Tc (MIN.) = 42.84
 LONGEST FLOWPATH FROM NODE 10540.00 TO NODE 10542.00 = 2839.29 FEET.
**********************
 FLOW PROCESS FROM NODE 10542.00 TO NODE 10542.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 42.84
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.530
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           qΑ
                                                   SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     A
                            8.37 0.98
                                           0.100
                                                    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.30
                                     0.98
                                            0.600
 AGRICULTURAL FAIR COVER
                      A 0.12
                                     0.88 1.000
 "ORCHARDS"
                                                    44
 PUBLIC PARK
                     A
                             1.18
                                     0.98 0.850 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.215
 SUBAREA AREA(ACRES) = 9.97 SUBAREA RUNOFF(CFS) = 11.86
 EFFECTIVE AREA(ACRES) = 14.83 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 14.8 PEAK FLOW RATE (CFS) = 14.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
```

Date: 04/21/2014 File name: LR0105ZZ.RES Page 23 Date: 04/21/2014

File name: LR0105ZZ.RES Page 24

Page 25

Date: 04/21/2014 File name: LR0105ZZ.RES

Date: 04/21/2014 File name: LR0105ZZ.RES Page 26

SCS

32

HEADWATER

>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.95;6H= 2.65;24H= 6.25 S-GRAPH: VALLEY (DEV.) = 100.0%; VALLEY (UNDEV.) / DESERT= 0.0% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 1.03; LAG(HR) = 0.83; Fm(INCH/HR) = 0.66; Ybar = 0.67 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 871.5 LONGEST FLOWPATH FROM NODE 10500.00 TO NODE 10543.00 = 14699.86 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0615; Lca/L=0.4,n=.0551; Lca/L=0.5,n=.0506; Lca/L=0.6,n=.0473 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 170.41 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) = 587.35 TOTAL PEAK FLOW RATE (CFS) = 587.35 (SOURCE FLOW INCLUDED) RATIONAL METHOD PEAK FLOW RATE(CFS) = 427.56 (UPSTREAM NODE PEAK FLOW RATE (CFS) = 427.56) PEAK FLOW RATE (CFS) USED = 587.35 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 10543.00 TO NODE 10543.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<< \_\_\_\_\_\_ \_\_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 871.5 TC (MIN.) = 62.07 AREA-AVERAGED Fm (INCH/HR) = 0.66 Ybar = 0.67PEAK FLOW RATE (CFS) = 587.35\_\_\_\_\_\_ \_\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0105ZZ.RES Page 27 Date: 04/21/2014 File name: LR0105ZZ.RES Page 28

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10614 (FILE LR0106ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0106ZZ.DAT

TIME/DATE OF STUDY: 14:33 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

				020/0.020 020/0.020 020/0.020					
1 *SI OF	Relati as (Ma C. (Depth ZE PIPE R EQUAL T	ve Flow-I ximum All )*(Veloci WITH A FI O THE UPS	ity) Const LOW CAPACI STREAM TRI		.0 (FT*F THAN E.*	T/S)		TED	
W U 1 F F S	WATERSHED USED "VAL UNITS/A FOR DEVEL PRECIPITA SIERRA MA	LAG = 0. LEY UNDEN CRE AND I OPMENTS ( TION DATA DRE DEPTE	.80 * TC /ELOPED" S LESS; AND DF 2 UNITS A ENTERED H-AREA FAC	ONS/PARAME' -GRAPH FOR "VALLEY DE' /ACRE AND I ON SUBAREA TORS USED. (AMC) II	DEVELOP VELOPED" MORE. BASIS.	S-GRA	PH	RAPH :	METHOD
FLC	W PROCES	S FROM NO	DDE 10600	**********	E 10601	.00 IS	CODE =		*****
>>U	JSE TIME-	OF-CONCE	NTRATION N	SUBAREA ANZ OMOGRAPH FO			AREA<<		
>>U ==== INI	JSE TIME- ====== ITIAL SUB	OF-CONCEN	NTRATION N ======= N-LENGTH(F		OR INITI ====== 18.17	AL SUB	======	===== 16	===== 23.00
>>U ==== INI ELE Tc SUE * 1 SUE DE	JSE TIME- TIAL SUB EVATION D  = K*[(LE BAREA ANA .00 YEAR BAREA TC EVELOPMEN LAND U	OF-CONCENCE AREA FLOW ATA: UPST ATA: UPST ATA: UPST ATA: US BRAINFALL AND LOSS AT TYPE/	NTRATION N N-LENGTH (F TREAM (FEET	OMOGRAPH F0 ======== EET) = 6:	DR INITI ==================================	AL SUB ===== INSTREA 20 12	======================================	SCS	Tc
>>U ==== INI ELE Tc SUE * 1 SUE DE	JSE TIME- TIAL SUB EVATION D  = K*[(LE BAREA ANA OO YEAR BAREA TC EVELOPMEN LAND U	OF-CONCEN	NTRATION N  V-LENGTH (F TREAM (FEET 00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	OMOGRAPH FOR STATE OF THE PROPERTY OF THE PROP	DR INITI ======= 18.17 .00 DOW GE)   **0. = 12.5 = 3.202	AL SUB NSTREA 20 12 //HR)	Ap	SCS CN	Tc (MIN.
>>U ==== INI ELE Tc SUE * 1 SUE DE	JSE TIME- TIAL SUB EVATION D  = K*[(LE BAREA ANA OO YEAR BAREA TC EVELOPMEN LAND U	OF-CONCEN	NTRATION N  V-LENGTH (F TREAM (FEET 00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	OMOGRAPH FOR STATE OF THE PROPERTY OF THE PROP	DR INITI ======= 18.17 .00 DOW GE)   **0. = 12.5 = 3.202	AL SUB NSTREA 20 12 //HR)	Ap	SCS CN	Tc (MIN.
>>U INI ELE TC SUE * 1 SUE DE RES "3- MOE COM SUE SUE SUE	JSE TIME-  TIAL SUB EVATION D  = K*[(LE BAREA ANA 00 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL 44 DWELLI BILE HOME MERCIAL BAREA AVE BAREA AVE BAREA RUN	OF-CONCENTAL CONTROL OF CONTROL O	VITRATION N V-LENGTH (F FREAM (FEET OO) / (ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU A A A VIOUS LOSS VIOUS AREA 25.	OMOGRAPH F ====================================	DR INITI ======= 18.17 .00 DOW  GE)]**0. = 12.5 = 3.202  Fp (INCH 4 0 2 0 5 0 INCH/HR) Ap = 0	AL SUB NSTREA 20 12 1/HR) .98 .98 .98 .98 .275	Ap (DECIMAL)  0.600 0.250 0.100 98	SCS CN 32 32 32	Tc (MIN.
>>U INI ELE TC SUE * 1 SUE DE RES "3- MOE COM SUE SUE SUE	JSE TIME-  TIAL SUB EVATION D  = K*[(LE BAREA ANA 00 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL 44 DWELLI BILE HOME MERCIAL BAREA AVE BAREA AVE BAREA RUN	OF-CONCENTAL CONTROL OF CONTROL O	VITRATION N V-LENGTH (F FREAM (FEET OO) / (ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU A A A VIOUS LOSS VIOUS AREA 25.	OMOGRAPH FF  EET) = 6: ) = 1625  ATION CHANG TC (MIN.) : (INCH/HR) : (AMC II): OIL AREA P (ACRES  3.3. 0.2: 6.1: RATE, FP ( FRACTION,	DR INITI ======= 18.17 .00 DOW  GE)]**0. = 12.5 = 3.202  Fp (INCH 4 0 2 0 5 0 INCH/HR) Ap = 0	AL SUB NSTREA 20 12 1/HR) .98 .98 .98 .98 .275	Ap (DECIMAL)  0.600 0.250 0.100 98	SCS CN 32 32 32	Tc (MIN.
>>U INI ELE TC SUE * 1 SUE DE RESS "3- MOE COM SUE SUE TOT	JEE TIME- TIAL SUB EVATION D  = K*[(LE BAREA ANA 00 YEAR BAREA TC EVELOPMEN LAND U LAND U BILE HOME MERCIAL BAREA AVE BAREA AVE BAREA RUN CAL AREA( BAREA ARE	OF-CONCENT OF CONCENT	NTRATION N N-LENGTH (F TREAM (FEET 00) / (ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU A A A 710US LOSS 710US AREA = 25. 9.71	OMOGRAPH F ====================================	DR INITI ======= 18.17 .00 DOW GE)]**0. = 12.5 = 3.202 Fp (INCH 4 0 2 0 5 0 INCH/HR) Ap = 0 DW RATE( CH):	AL SUB 	Ap (DECIMAL)  0.600 0.250 0.100 98	SCS CN 32 32 32 32	Tc (MIN. 16.9 13.8 12.5
>>U ==== INI ELE * 1 SUE * 1 SUE DE RES "3- MOE COM SUE SUE TOT SUE 5M	JSE TIME-  TIAL SUB EVATION D  = K*[(LE BAREA ANA .00 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL -4 DWELLI BILE HOME MMERCIAL BAREA AVE BA	OF-CONCENTIAL CONTROL OF CONTROL	NTRATION N N-LENGTH (F TREAM (FEET	OMOGRAPH FOR STATE OF THE PROPERTY OF THE PROP	DR INITI 18.17 .00 DOW GE)]**0	AL SUB 	Ap (DECIMAL)  0.600 0.250 0.100 98  25.6  2.75; 24H  ***********************************	SCS CN 32 32 32 32 3 8 = 6 *****	Tc (MIN. 16.9 13.8 12.5
>>COMESURE SUBSTITUTE	JEE TIME-  TIAL SUB EVATION D  = K*[(LE BAREA ANA .00 YEAR EVELOPMEN LAND U SIDENTIAL -4 DWELLI BILE HOME MMERCIAL BAREA AVE BAREA AVE BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.46;  ***********************************	OF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-COF-COF-COF-COF-COF-COF-COF-COF-COF-	NTRATION N N-LENGTH (F TREAM (FEET N-LENGTH (F TREAM (F T TREAM (F T T T T T T T T T T T T T T T T T T T	OMOGRAPH FOR STATE OF THE PROPERTY OF THE PROP	DR INITI	AL SUB 	Ap (DECIMAL)  0.600 0.250 0.100 98  25.6  2.75; 24H  ***********************************	SCS CN 32 32 32 32 3 8 = 6 *****	Tc (MIN. 16.9 13.8 12.5

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.36
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREET FLOW DEPTH (FEET) = 0.57
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 20.55
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.36
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.05
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 15.26
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.843
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fp
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.61
                                                                                       LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 22.82
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" A 2.24 0.98 0.600 32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.90
                                                                                   COMMERCIAL
                                                                                                       A 4.90 0.98 0.100 32
 STREET FLOW TRAVEL TIME (MIN.) = 1.64 Tc (MIN.) = 14.15
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.974
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.257
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   SUBAREA AREA (ACRES) = 7.14 SUBAREA RUNOFF (CFS) = 16.66
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ap SCS
                                                                                   EFFECTIVE AREA(ACRES) = 23.08 AREA-AVERAGED Fm(INCH/HR) = 0.25
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.26
                                                                                   TOTAL AREA (ACRES) = 23.1 PEAK FLOW RATE (CFS) =
 MOBILE HOME PARK A 0.33 0.98 0.250 32
                                                                                                                                           53.81
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.58 0.98 0.600 32
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
             A 4.32 0.98 0.100 32
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.235
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 6.23 SUBAREA RUNOFF (CFS) = 15.39
                                                                                   DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.65
 EFFECTIVE AREA(ACRES) = 15.94 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                                   FLOW VELOCITY (FEET/SEC.) = 5.52 DEPTH*VELOCITY (FT*FT/SEC.) = 3.26
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.26
                                                                                  LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10603.00 = 1276.85 FEET.
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) =
                                                                                 ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   FLOW PROCESS FROM NODE 10603.00 TO NODE 10604.00 IS CODE = 63
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  >>>> (STREET TABLE SECTION # 13 USED) <<<<
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.30
                                                                                 ______
 FLOW VELOCITY (FEET/SEC.) = 3.20 DEPTH*VELOCITY (FT*FT/SEC.) = 2.06
                                                                                   UPSTREAM ELEVATION(FEET) = 1608.00 DOWNSTREAM ELEVATION(FEET) = 1596.00
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10602.00 = 922.21 FEET.
                                                                                  STREET LENGTH (FEET) = 420.77 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET HALFWIDTH (FEET) = 32.00
******************
 FLOW PROCESS FROM NODE 10602.00 TO NODE 10603.00 IS CODE = 63
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1620.00 DOWNSTREAM ELEVATION(FEET) = 1608.00
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 354.64 CURB HEIGHT (INCHES) = 8.0
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 32.00
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                      62.88
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.63
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 23.84
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.36
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.40
```

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

Date: 04/21/2014 File name: LR0106ZZ.RES Page 3 Date: 04/21/2014 File name: LR0106ZZ.RES Page 4

STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 16.56	RESIDENTIAL
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.706	"3-4 DWELLINGS/ACRE" A 8.73 0.98 0.600 32
SUBAREA LOSS RATE DATA(AMC II):	COMMERCIAL A 3.00 0.98 0.100 32
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	MOBILE HOME PARK A 3.84 0.98 0.250 32
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.417
"3-4 DWELLINGS/ACRE" A 2.80 0.98 0.600 32	SUBAREA AREA (ACRES) = 15.57 SUBAREA RUNOFF (CFS) = 27.24
COMMERCIAL A 4.90 0.98 0.100 32	EFFECTIVE AREA(ACRES) = 46.90 AREA-AVERAGED Fm(INCH/HR) = 0.31
RESIDENTIAL	AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.31
"3-4 DWELLINGS/ACRE" B 0.05 0.75 0.600 56	TOTAL AREA (ACRES) = 46.9 PEAK FLOW RATE (CFS) = 86.32
COMMERCIAL B 0.50 0.75 0.100 56	TOTAL AREA (ACRES) - 40.9 FEAR FLOW RATE (CFS) - 00.32
	OUDADRA ADRA AVEDACED DATABATA DEDENIATAGUA.
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
SUBAREA AREA (ACRES) = 8.25 SUBAREA RUNOFF (CFS) = 18.13	
EFFECTIVE AREA (ACRES) = 31.33 AREA-AVERAGED Fm (INCH/HR) = 0.26	END OF SUBAREA STREET FLOW HYDRAULICS:
AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.26	DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 34.91
TOTAL AREA (ACRES) = 31.3 PEAK FLOW RATE (CFS) = 69.10	FLOW VELOCITY(FEET/SEC.) = 3.57 DEPTH*VELOCITY(FT*FT/SEC.) = 3.02
	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	AND L = $926.3$ FT WITH ELEVATION-DROP = $6.0$ FT, IS $38.6$ CFS,
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50	WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10605.00
	LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10605.00 = 2623.88 FEET.
END OF SUBAREA STREET FLOW HYDRAULICS:	
DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.70	*********************
FLOW VELOCITY(FEET/SEC.) = 5.49 DEPTH*VELOCITY(FT*FT/SEC.) = 3.58	FLOW PROCESS FROM NODE 10605.00 TO NODE 10606.00 IS CODE = 63
LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10604.00 = 1697.62 FEET.	
	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************	>>>> (STREET TABLE SECTION # 18 USED) <<<<
FLOW PROCESS FROM NODE 10604.00 TO NODE 10605.00 IS CODE = 63	
	UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1587.00
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA	STREET LENGTH (FEET) = 420.00 CURB HEIGHT (INCHES) = 8.0
>>>> (STREET TABLE SECTION # 18 USED) <<<<	STREET HALFWIDTH (FEET) = 26.00
UPSTREAM ELEVATION(FEET) = 1596.00 DOWNSTREAM ELEVATION(FEET) = 1590.00	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
STREET LENGTH (FEET) = 926.26 CURB HEIGHT (INCHES) = 8.0	INSIDE STREET CROSSFALL(DECIMAL) = 0.020
STREET HALFWIDTH (FEET) = 26.00	OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
21.22121.(222)	0.000
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
INSIDE STREET CROSSFALL (DECIMAL) = 0.020	STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
COLOTER CHARACTER (BECTARD)	Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020	MAXIMOM ADDOWNDDE STREET FROM DELTH(FEBT) - 1.07
SIREEI FARRWAI CROSSFALL(DECIMAL) - 0.020	
Manningle EDICHION EACHOD for Chroatfley Costion (such to such) - 0.0100	** TO AVEL TIME COMPUTED NOTICE ECTIMATED FLOW (CEC) _ 00 1/
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 98.14
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	***STREET FLOWING FULL***
	***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 TC(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.94	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.94  STREET FLOW TRAVEL TIME(MIN.) = 4.38 TC(MIN.) = 20.94  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.351	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.94  STREET FLOW TRAVEL TIME(MIN.) = 4.38 TC(MIN.) = 20.94  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.351  SUBAREA LOSS RATE DATA(AMC II):	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 8.05 0.98 0.600 32
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.94  STREET FLOW TRAVEL TIME(MIN.) = 4.38 Tc(MIN.) = 20.94  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.351  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 8.05 0.98 0.600 32  COMMERCIAL A 2.41 0.98 0.100 32
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.74  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.84  HALFSTREET FLOOD WIDTH(FEET) = 34.42  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.52  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.94  STREET FLOW TRAVEL TIME(MIN.) = 4.38  Tc(MIN.) = 20.94  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.351  SUBAREA LOSS RATE DATA(AMC II):	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.86  HALFSTREET FLOOD WIDTH(FEET) = 35.88  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32  STREET FLOW TRAVEL TIME(MIN.) = 1.82 Tc(MIN.) = 22.77  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.236  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 8.05 0.98 0.600 32

Date: 04/21/2014

File name: LR0106ZZ.RES

Page 6

Date: 04/21/2014

File name: LR0106ZZ.RES

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.421
 SUBAREA AREA(ACRES) = 14.39 SUBAREA RUNOFF(CFS) = 23.64
 EFFECTIVE AREA(ACRES) = 61.29 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 61.3 PEAK FLOW RATE (CFS) = 105.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 36.80
 FLOW VELOCITY (FEET/SEC.) = 3.91 DEPTH*VELOCITY (FT*FT/SEC.) = 3.45
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 420.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 44.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10606.00
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10606.00 = 3043.88 FEET.
******************
 FLOW PROCESS FROM NODE 10606.00 TO NODE 10607.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1587.00 DOWNSTREAM ELEVATION(FEET) = 1585.00
 STREET LENGTH (FEET) = 536.63 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.42
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.01
   HALFSTREET FLOOD WIDTH (FEET) = 43.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.21
 STREET FLOW TRAVEL TIME (MIN.) = 2.81 Tc (MIN.) = 25.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.085
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      A 1.08 0.98
 COMMERCIAL
                                               0.100 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 11.66 0.98
                                                 0.600 32
                       A
                              4.18
                                                 0.250 32
 MOBILE HOME PARK
                                         0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
 SUBAREA AREA (ACRES) = 16.92 SUBAREA RUNOFF (CFS) = 24.60
 EFFECTIVE AREA(ACRES) = 78.21 AREA-AVERAGED Fm(INCH/HR) = 0.36
```

```
TOTAL AREA (ACRES) =
                    78.2 PEAK FLOW RATE (CFS) = 121.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.02 HALFSTREET FLOOD WIDTH(FEET) = 43.64
 FLOW VELOCITY (FEET/SEC.) = 3.21 DEPTH*VELOCITY (FT*FT/SEC.) = 3.27
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 536.6 FT WITH ELEVATION-DROP = 2.0 FT, IS 44.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10607.00
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10607.00 = 3580.51 FEET.
*******************
 FLOW PROCESS FROM NODE 10607.00 TO NODE 10608.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1585.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
 STREET LENGTH (FEET) = 764.25 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.97
   HALFSTREET FLOOD WIDTH (FEET) = 41.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.08
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.95
 STREET FLOW TRAVEL TIME (MIN.) = 3.12 Tc (MIN.) = 28.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.946
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               Aр
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 22.59 0.98 0.600 32
 COMMERCIAL
                       Α
                              1.69
                                         0.98
                                                 0.100 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.565
 SUBAREA AREA (ACRES) = 24.28 SUBAREA RUNOFF (CFS) = 30.47
 EFFECTIVE AREA(ACRES) = 102.49 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.42
 TOTAL AREA (ACRES) = 102.5 PEAK FLOW RATE (CFS) = 142.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
```

Date: 04/21/2014 File name: LR0106ZZ.RES

Page 8

AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.37

Date: 04/21/2014 File name: LR0106ZZ.RES Page 7

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 41.68
 FLOW VELOCITY (FEET/SEC.) = 4.11 DEPTH*VELOCITY (FT*FT/SEC.) = 4.03
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 764.2 FT WITH ELEVATION-DROP = 5.0 FT, IS 60.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10608.00
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10608.00 = 4344.76 FEET.
******************
 FLOW PROCESS FROM NODE 10608.00 TO NODE 10609.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1580.00 DOWNSTREAM ELEVATION (FEET) = 1575.00
 STREET LENGTH (FEET) = 1057.88 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 159.17
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.07
   HALFSTREET FLOOD WIDTH (FEET) = 46.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.01
 STREET FLOW TRAVEL TIME (MIN.) = 4.70 Tc (MIN.) = 33.41
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Дp
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
                       A 10.97 0.88
                                                1.000 44
  "ORCHARDS"
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 20.08
                                         0.98
                                                  0.600 32
                               2.51
                                          0.98
                                                  0.100 32
                         Α
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA(ACRES) = 33.56 SUBAREA RUNOFF(CFS) = 34.17
 EFFECTIVE AREA(ACRES) = 136.05 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 136.0 PEAK FLOW RATE (CFS) = 160.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.07 HALFSTREET FLOOD WIDTH(FEET) = 46.32
```

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.86
 PIPE-FLOW(CFS) =
                    37.30
 PIPEFLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 30.19
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.888
 SUBAREA AREA (ACRES) = 33.56 SUBAREA RUNOFF (CFS) = 37.53
 TOTAL AREA (ACRES) = 136.0 PEAK FLOW RATE (CFS) = 174.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 136.94
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.02
   HALFSTREET FLOOD WIDTH (FEET) = 43.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.68
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10609.00 = 5402.64 FEET.
******************
 FLOW PROCESS FROM NODE 10609.00 TO NODE 10610.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1575.00 DOWNSTREAM ELEVATION (FEET) = 1565.00
 STREET LENGTH (FEET) = 1098.26 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 187.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.02
   HALFSTREET FLOOD WIDTH (FEET) = 43.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.99
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.07
 STREET FLOW TRAVEL TIME (MIN.) = 3.67 Tc (MIN.) = 33.86
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.762
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
```

Date: 04/21/2014 File name: LR0106ZZ.RES

Page 10

FLOW VELOCITY (FEET/SEC.) = 3.76 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.04

Date: 04/21/2014 File name: LR0106ZZ.RES Page 9

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
RESIDENTIAL "3-4 DWELLINGS/ACRE"	A	1.61	0.98	0.600	32
AGRICULTURAL FAIR COVER		05.42	0.00	1 000	4.4
"ORCHARDS" COMMERCIAL	A 7		0.88 0.98		44
SUBAREA AVERAGE PERVIOUS					32
SUBAREA AVERAGE PERVIOUS		_		• • • •	
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/HI	29.78 165.8	SUBARE 33 AREA	A RUNOFF(CF -AVERAGED F	m(INCH/HR)	00 = 0.52
TOTAL AREA (ACRES) =	165.8	PEA	K FLOW RATE	(CFS) =	184.86
SUBAREA AREA-AVERAGED RA 5M = 0.46; 30M = 0.95; 3				2.75; 24HF	R = 6.50
END OF SUBAREA STREET FIDEPTH (FEET) = 1.01 HAI FLOW VELOCITY (FEET/SEC.)  ** PIPE SIZED TO CARRY ' ESTIMATED PIPE DIAMETER ASSUME FULL-FLOWING PIPE PIPE-FLOW VELOCITY (FEET, PIPE-FLOW (CFS) = 5: PIPEFLOW TRAVEL TIME (MIN * 100 YEAR RAINFALL INTE SUBAREA AREA (ACRES) = TOTAL AREA (ACRES) =  SUBAREA AREA-AVERAGED RESULT OF A STREET HYDRAULICS DESTREET HYDRAULICS COMPUTATION OF THE STREET FLOW MODEL RESULT STREET FLOW MODEL RESULT STREET FLOW DEPTH (FEET)	LFSTREET  = 4.98 FOTAL UPS (INCH) = ELINE /SEC.) = 1.77 N.) = 1 ENSITY(IN 29.78 165.8 AINFALL I LHR = 1.2 ASED ON M TED USING L*** LTS USING T) = 0.9	FLOOD WID B DEPTH* CTREAM PIP 24.00  16.46  1.11 TC NCH/HR) = SUBARE PEA DEPTH (INCH 25; 3HR = 4AINLINE T G ESTIMATE 64	VELOCITY (FT EFLOW ** NUMBER OF  (MIN.) = 3 1.847 A RUNOFF (CF K FLOW RATE ): 2.03; 6HR = c: D FLOW (CFS)	*FT/SEC.) = PIPES = 1 1.30 S) = 28.2 (CFS) = 2.75; 24H	28 197.55
HALFSTREET FLOOD WIDTH			60		
AVERAGE FLOW VELOCITY PRODUCT OF DEPTH&VELOG					
LONGEST FLOWPATH FROM NO				00 = 650	00.90 FEET.
**************************************					
>>>>COMPUTE TRAPEZOIDAL					========
ELEVATION DATA: UPSTREAM CHANNEL LENGTH THRU SUBAC CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.045 CHANNEL FLOW THRU SUBAC FLOW VELOCITY (FEET/SEC.) TRAVEL TIME (MIN.) = 6 LONGEST FLOWPATH FROM NO	AREA (FEET 0.00 ' 0.00	r) = 1070 'Z" FACTOR MUM DEPTH( = 197. 93 FLOW (MIN.) =	.05 CHANN = 75.000 FEET) = 2 55 DEPTH (FEET) 37.40	EL SLOPE = .00 = 0.95	1542.00 0.0215
**************************************					

>>>>ADDITION OF SUBAR	EA TO MAINI	LINE PEAK	FLOW<		
MAINLINE Tc(MIN.) =	37.40	======	=======	=======	========
* 100 YEAR RAINFALL IN		CH/HR) =	1.660		
SUBAREA LOSS RATE DATA					
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.10	0.86 0.98	1.000	46
COMMERCIAL	A	0.50	0.98	0.100	32
SCHOOL RESIDENTIAL	А	44.97	0.98	0.600	32
"3-4 DWELLINGS/ACRE"	Δ	N 33	0.08	0 600	32
AGRICULTURAL FAIR COVE	R	0.33	0.50	0.000	52
"ORCHARDS"		0.47	0.88	1.000	44
SUBAREA AVERAGE PERVIO					
SUBAREA AVERAGE PERVIO					
SUBAREA AREA(ACRES) =					
EFFECTIVE AREA(ACRES)	= 212.20	AREA-	AVERAGED Fm	(INCH/HR)	= 0.54
AREA-AVERAGED Fp(INCH/					
TOTAL AREA (ACRES) =	212.2	PEAK	FLOW RATE (	CFS) =	214.57
SUBAREA AREA-AVERAGED				0.75.041	D ( F0
5M = 0.46; 30M = 0.95;	IHR = 1.23	); SHK =	2.03; OHR =	2.73; Z4H.	R = 0.30
>>>>COMPUTE TRAPEZOID	AL CHANNEL	ET OWAZZZ			
>>>>TRAVELTIME THRU S ====================================	UBAREA (EXI ====================================	ISTING EL ======= 1542.0 = 1122 Z" FACTOR JM DEPTH( 214.	EMENT) <<<< =================================	======================================	1515.00
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE(FEET) = MANNING'S FACTOR = 0.0	UBAREA (EXI ====================================	ISTING EL ======= 1542.0 = 1122 Z" FACTOR JM DEPTH( 214.	EMENT) <<<< =================================	======================================	1515.00
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) =	UBAREA (EXI ====================================	ISTING EL ====================================	EMENT) <<<< =================================	AM(FEET) = EL SLOPE = .00 = 0.96	1515.00 0.0241
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC	UBAREA (EXI ====================================	ISTING EL ====================================	EMENT) <<<< =================================	AM(FEET) = EL SLOPE = .00 = 0.96	1515.00 0.0241
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBAFLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM	UBAREA (EXI ====================================	ISTING EL =======  1542.0   = 1122 Z" FACTOR JM DEPTH( 214.3 3 FLOW 4IN.) = 0.00 TO N	EMENT) <<<< ================================	AM(FEET) = EL SLOPE = .00 = 0.96 = 86	1515.00 0.0241 93.47 FEET.
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM	UBAREA (EXI ====================================	ISTING EL ====================================	EMENT) <<<< ================================	AM(FEET) = EL SLOPE = .00 = 0.96 00 = 86	1515.00 0.0241 93.47 FEET.
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM	UBAREA (EXI ====================================	ISTING EL =======  1542.0   = 1122 E' FACTOR JM DEPTH( 214.3 FLOW MIN.) = 0.00 TO N ************************************	EMENT) <<<< ================================	AM(FEET) = EL SLOPE = .00 = 0.96 00 = 86	1515.00 0.0241 93.47 FEET.
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************************	UBAREA (EXI 	ISTING EL 1542.0 1 = 1122 "FACTOR IM DEPTH( 214. 3 FLOW MIN.) = 0.00 TO N ************************************	EMENT) <<<< ========== 0 DOWNSTRE .52 CHANN = 75.000 FEET) = 2 57 DEPTH (FEET) 43.38 ODE 10612. ************************************	AM(FEET) = EL SLOPE = .00 = 0.96 00 = 86	1515.00 0.0241 93.47 FEET.
ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************************	UBAREA (EXI ====================================	ISTING EL  1542.0  1 = 1122  " FACTOR JM DEPTH( 214.3  3 FLOW MIN.) = 0.00 TO N  ********  TO NODE LINE PEAK CH/HR) = AREA (ACRES) 28.27  TE, Fp(IN ACTION, A SUBARE 7 AREA-A	EMENT) <<<<< ================================	AM(FEET) = EL SLOPE = .00 = 0.96 00 = 86 ******* S CODE =	1515.00 0.0241 93.47 FEET. ***********************************

File name: LR0106ZZ.RES

Page 12

Date: 04/21/2014

Date: 04/21/2014 File name: LR0106ZZ.RES Page 11

```
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
FLOW PROCESS FROM NODE 10612.00 TO NODE 10613.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1515.00 DOWNSTREAM(FEET) = 1480.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1037.86 CHANNEL SLOPE = 0.0337
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 75.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 214.57
 FLOW VELOCITY (FEET/SEC.) = 3.55 FLOW DEPTH (FEET) = 0.90
 TRAVEL TIME (MIN.) = 4.87 Tc (MIN.) = 48.25
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10613.00 = 9731.33 FEET.
*******************
 FLOW PROCESS FROM NODE 10613.00 TO NODE 10613.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 48.25
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.425
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Ар
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                          17.15
                                 0.98 0.600 32
 SCHOOL
 SCHOOL
                     В
                           4.35
                                   0.75
                                          0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.50
                           SUBAREA RUNOFF (CFS) = 16.78
 EFFECTIVE AREA(ACRES) = 261.97 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.57
 TOTAL AREA(ACRES) = 262.0
                           PEAK FLOW RATE(CFS) = 214.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 10613.00 TO NODE 10614.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1445.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1284.19 CHANNEL SLOPE = 0.0273
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 40.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 214.57
 FLOW VELOCITY (FEET/SEC.) = 3.85 FLOW DEPTH (FEET) = 1.18
 TRAVEL TIME (MIN.) = 5.55 Tc (MIN.) = 53.80
 LONGEST FLOWPATH FROM NODE 10600.00 TO NODE 10614.00 = 11015.52 FEET.
```

File name: LR010677.RFS

Page 13

Date: 04/21/2014

FLOW PROCESS FROM NODE 10614.00 TO NODE 10614.00 IS CODE = 81 \_\_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc (MIN.) = 53.80\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.335 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN SCHOOL 24.96 0.98 0.600 32 NATURAL FAIR COVER "OPEN BRUSH" A 0.05 0.86 1.000 46 B 5.81 0.600 56 SCHOOL 0.75 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.10 0.98 0.600 32 AGRICULTURAL FAIR COVER "ORCHARDS" 0.07 0.88 1.000 Α SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.602 SUBAREA AREA(ACRES) = 30.99 SUBAREA RUNOFF(CFS) = 21.59 EFFECTIVE AREA(ACRES) = 292.96 AREA-AVERAGED Fm(INCH/HR) = 0.55 AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.58 TOTAL AREA (ACRES) = 293.0 PEAK FLOW RATE(CFS) = 214.57 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50\_\_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 293.0 TC (MIN.) = 53.80 EFFECTIVE AREA(ACRES) = 292.96 AREA-AVERAGED Fm(INCH/HR) = 0.55 AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.576 PEAK FLOW RATE (CFS) = 214.57

\_\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0106ZZ.RES Page 14

Date: 04/21/2014 File name: LR0106ZZ.RES Page 15 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10714 (FILE LR0107ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*

FILE NAME: LR0107ZZ.DAT

Date: 04/21/2014

TIME/DATE OF STUDY: 14:33 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGI AND HIDRAULIC MODEL INFORMATION.

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 15.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.67 2.00 0.0312 0.167 0.0180 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

File name: LR0107ZZ.RES

Page 1

19	26.0 52.0	15.0 20.0	0.020/0.020 0.020/0.020 0.020/0.020	)/0.020 )/0.020	0.67 0.67	2.00	0.0312 0	.167	0.0180
			DEPTH CONSTRA Depth = 0.20						
Τ			lowable Stree		enth) -	(Ton-	of-Curb)		
2			ity) Constrai				,		
*SI	ZE PIPE	WITH A F	LOW CAPACITY	GREATER	THAN				
	~ -		STREAM TRIBUT						
*US	ER-SPECI	FIED MIN	IIMUM TOPOGRAE	PHIC SLOP	E ADJUST	TMENT I	NOT SELEC	TED	
UNI	T-HYDROG	RAPH MOD	EL SELECTIONS	S/PARAMET	ERS:				
W.	ATERSHEI	LAG = 0	.80 * Tc						
U	SED "VAI	LEY UNDE	VELOPED" S-GF	RAPH FOR	DEVELOPM	MENTS (	OF		
			LESS; AND "VA			S-GRA	PH		
			OF 2 UNITS/AC						
			'A ENTERED ON		BASIS.				
			'H-AREA FACTOF CONDITION (A		ccimen i	COD IINI	תעטט ייד	ים ז סי	мгти∩г
MIN I	ECEDENI	MOISTORE	CONDITION (F	MC) II A	I damocc.	OK ON.	II HIDROG	INAFII	MEINOD
****	******	*****	*****	******	*****	*****	******	****	*****
FLO	W PROCES	S FROM N	ODE 10700.00	TO NODE	10701.	.00 IS	CODE =	21	
>>>		IAL METHO	D INITIAL SUE	BAREA ANA	.LYSIS<<	<<<			
N N TT	OD DIME	OF CONCE	NUMBER TRANSPORTER	מת זות גים	D TNITMIT	T CIID	א ח ה א ע ע		
			NTRATION NOMO						
====	======				======			:====	=====
INI	====== TIAL SUE	BAREA FLO	W-LENGTH (FEET	 r) = 71	3.44		======		
INI	====== TIAL SUE	BAREA FLO		 r) = 71	3.44		======		
INI' ELE'	====== TIAL SUE VATION I = K*[(LE	BAREA FLO DATA: UPS	W-LENGTH (FEET TREAM (FEET) =		3.44 00 DOWN E)]**0.2	=====   STREA    20	======		
INI' ELE' TC	====== TIAL SUE VATION I = K*[(LE AREA ANA	BAREA FLO DATA: UPS CNGTH** 3	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVAT) ED MINIMUM TO	T) = 71 = 1595. ION CHANG	3.44 00 DOWN E)]**0.2	=====   STREA    20	======		
INI' ELE' Tc: SUB.	TIAL SUE VATION I = K*[(LE AREA ANA	BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN	T) = 71 = 1595. TON CHANG C(MIN.) =	3.44 00 DOWN E)]**0.2 11.35 3.394	=====   STREA    20	======		
INI ELE Tc : SUB. * 1	TIAL SUE VATION I  K*[(LE AREA ANA 00 YEAR AREA TC	BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) =	3.44 00 DOWN E)]**0.2 11.35 3.394	: NSTREAI 20 53	======= M(FEET) =	: 15	90.00
INI ELE Tc : SUB. * 1	TIAL SUE VATION I  K*[(LE AREA ANA 00 YEAR AREA TC VELOPMEN	BAREA FLO BATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) = MC II): L AREA	3.44 00 DOWN E)]**0.2 11.35 3.394	: NSTREAI 20 53	======================================	: 15	90.00 Tc
INI' ELE TC : SUB. * 1 SUB. DE	TIAL SUE VATION I  = K*[(LE AREA ANA 00 YEAR AREA TC VELOPMEN LAND U	BAREA FLO BATA: UPS ENGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ ISE	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) = MC II): L AREA	3.44 00 DOWN E)]**0.2 11.35 3.394	: NSTREAI 20 53	======================================	: 15	90.00 Tc
INI' ELE TC SUB. * 1 SUB. DE	TIAL SUE VATION I  K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAL	BAREA FLO DATA: UPS ENGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE	W-LENGTH (FEET TREAM (FEET) = .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAL 20 53	M(FEET) = Ap (DECIMAL)	SCS CN	90.00 Tc (MIN.
INI' ELE' TC : SUB. * 1 SUB. DE RES "3-	TIAL SUE VATION I  K* [(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI	BAREA FLO DATA: UPS ENGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE L INGS/ACRE	W-LENGTH (FEET TREAM (FEET) =  .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAL 20 53	M(FEET) = Ap (DECIMAL)	SCS CN	90.00 Tc (MIN.
INI' ELE TC SUB. * 1 SUB. DE' RES #3- AGR	TIAL SUE VATION I  K*[(LE AREA ANF 00 YEAR AREA TC VVELOPMEN LAND I IDENTIAI 4 DWELLI ICULTURF	BAREA FLO DATA: UPS ENGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  " A	TON CHANG C (MIN.) = NCH/HR) = MC II): AREA (ACRES)	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH,	NSTREAM 20 53 'HR)	Ap (DECIMAL)	SCS CN 32	90.00 Tc (MIN.
INI' ELE TC SUB. * 1 SUB. DE RES "3- AGR	TIAL SUE VATION I  K* [(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI	BAREA FLO ATA: UPS  MISTH** 3 ALYSIS US RAINFALL AND LOSS ISE MISSE ANGS/ACRE AL FAIR C	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  " A	TON CHANG C (MIN.) = NCH/HR) = MC II): AREA (ACRES)	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAM 20 53 'HR)	M(FEET) = Ap (DECIMAL)	SCS CN 32	90.00 Tc (MIN. 15.3
TC SUB. * 1 SUB. DE  RES "3- AGR "ORI COM	TIAL SUE VATION I  = K*[(LE AREA ANA 00 YEAR AREA TC LAND U IDENTIAI 4 DWELLI ICULTURA CHARDS"	BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS UT SE LL	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  W A  OVER A	TON CHANG C(MIN.) = NCH/HR) = MC II): AREA (ACRES) 0.96 2.89 0.58	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH)	NSTREAD 20 53 /HR) .98 .88	Ap (DECIMAL) 0.600 1.000	scs CN 32 44 32	90.00  Tc (MIN. 15.3 26.3 11.3
INI' ELE TC : SUB. * 1 SUB. DE RES "3- AGR "OR COM RES	TIAL SUE VATION I  = K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI ICULTURF CHARDS" MERCIAL MERCIAL IDENTIAI	AREA FLO ATA: UPS ANGTH** 3 ALYSIS US RAINFALL AND LOSS AT TYPE/ ANGS/ACRE ANGS/ACRE AL FAIR C	W-LENGTH (FEET TREAM (FEET) =  0.00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN SCS SOIL GROUP  " A OVER A B	TON CHANG C(MIN.) = NCH/HR) =	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAL 20 53 // HR) .98 .88 .98 .75	Ap (DECIMAL)  0.600  1.000 0.100 0.100	SCS CN 32 44 32 56	90.00  Tc (MIN.  15.3  26.3  11.3
INI' ELE TC : SUB. * 1 SUB. DE RES "3- AGR "OR COM RES	TIAL SUE VATION I  = K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI ICULTURF CHARDS" MERCIAL MERCIAL IDENTIAI	AREA FLO ATA: UPS ANGTH** 3 ALYSIS US RAINFALL AND LOSS AT TYPE/ ANGS/ACRE ANGS/ACRE AL FAIR C	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  W A  OVER A A	TON CHANG C(MIN.) = NCH/HR) =	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAL 20 53 // HR) .98 .88 .98 .75	Ap (DECIMAL)  0.600  1.000 0.100 0.100	SCS CN 32 44 32 56	90.00  Tc (MIN.  15.3  26.3  11.3
INI' ELE  TC: SUB. * 1 SUB. DE  RESS "3- AGR "OR COMM RESS "3-	TIAL SUE VATION I  = K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI ICULTURF CHARDS" MERCIAL MERCIAL IDENTIAI	AREA FLO ATA: UPS  INGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ ISE INGS/ACRE LL FAIR C	W-LENGTH (FEET TREAM (FEET) =  0.00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN SCS SOIL GROUP  " A OVER A B	TON CHANG C(MIN.) = CCH/HR) = MC II): AREA (ACRES) 0.96 2.89 0.58 1.54	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/	NSTREAL 20 53	Ap (DECIMAL)  0.600  1.000 0.100 0.100	SCS CN 32 44 32 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INI' ELE TC: SUB. * 1 SUB. DE RES "3- AGR "OR COMM RES "3- MOB	TIAL SUE VATION I  = K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI ICULTURF CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI ILE HOME	PAREA FLO PATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ ISE INGS/ACRE LL FAIR C	W-LENGTH (FEET TREAM (FEET) =  .00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  " A OVER A A B	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = 100 (MIN.)	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH) 0.0 0.0	NSTREAL 20 53 4 7 HR) 98 88 98 .75 .75 .75	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.600 0.250	SCS CN 32 44 32 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INI' ELE TC SUB. * 1 SUB. DE RES "3- AGR "OR COMM RES "3- MOB SUB.	TIAL SUE VATION I  = K*[(LE AREA ANF 00 YEAR AREA TC VELOPMEN LAND U IDENTIAI 4 DWELLI ICULTURF CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI ILE HOME AREA AVE	PAREA FLO PATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE CNGS/ACRE LL FAIR C CNGS/ACRE C PARK CRAGE PER	W-LENGTH (FEET TREAM (FEET) =  0.00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOIL GROUP  " A OVER A B B B	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = 100 MIN. (MIN.) = 1	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/ 0.0 0.0 0.0 NCH/HR)	NSTREAL 20 53	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.600 0.250	SCS CN 32 44 32 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INI' ELE TC: SUB. * 1 SUB. DE RESS: "3- AGR "OR: COMM RESS: "3- MOB SUB. SUB. SUB. SUB.	TIAL SUE VATION I  = K* [(LE AREA ANA 00 YEAR AREA TC LAND U IDENTIAI 4 DWELLI ICULTURA CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI IDENTIAI 4 DWELLI ILE HOME AREA AVE AREA AVE	BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS ISE LL FAIR C CNGS/ACRE LL FAIR C CNGS/ACRE CRAGE PER CRAGE PER CRAGE PER CRAGE PER	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  A OVER  A B WIOUS LOSS RA VIOUS AREA FF = 25.48	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = NCH/HR) = MC II):  AREA (ACRES)  0.96  2.89 0.58 1.54  1.44 2.21  ATE, FP(IRACTION,	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/ 0.0 0.0 0.0 NCH/HR) Ap = 0.0	NSTREAL 20 53	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.250	SCS CN 32 44 32 56 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INI' ELE TC: SUB. * 1 SUB. DE RESS: "3- AGR "OR: COMM RESS: "3- MOB SUB. SUB. SUB. SUB.	TIAL SUE VATION I  = K* [(LE AREA ANA 00 YEAR AREA TC LAND U IDENTIAI 4 DWELLI ICULTURA CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI IDENTIAI 4 DWELLI ILE HOME AREA AVE AREA AVE	BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS ISE LL FAIR C CNGS/ACRE LL FAIR C CNGS/ACRE CRAGE PER CRAGE PER CRAGE PER CRAGE PER	W-LENGTH (FEET TREAM (FEET) =  3.00) / (ELEVAT) ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOIL GROUP  " A OVER A B WIOUS LOSS RA VIOUS AREA FF	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = NCH/HR) = MC II):  AREA (ACRES)  0.96  2.89 0.58 1.54  1.44 2.21  ATE, FP(IRACTION,	3.44 00 DOWN E)]**0.2 11.35 3.394 Fp (INCH/ 0.0 0.0 0.0 NCH/HR) Ap = 0.0	NSTREAL 20 53	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.250	SCS CN 32 44 32 56 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INITELET  TC: SUB. * 1 SUB. DE  RES "3- AGR "OR COMM RES "3- MOB SUB. SUB. SUB. SUB. SUB.	TIAL SUE VATION I  = K* [(LE AREA ANF 00 YEAR AREA TC LAND I IDENTIAL 4 DWELLI ICULTURA CHARDS" MERCIAL MERCIAL IDENTIAL 4 DWELLI IDENTIAL AFEA AVE AREA AVE AREA RUN AL AREA	AREA FLO ATA: UPS ANGTH** 3 ALYSIS US RAINFALL AND LOSS ITYPE/ ISE ANGS/ACRE	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  "A OVER A B WIOUS LOSS RA VIOUS AREA FF = 25.48 9.62	T) = 71 = 1595. TON CHANG C(MIN.) = NCH/HR) = MC II): AREA (ACRES) 0.96 2.89 0.58 1.54 1.44 2.21 ATE, FP(I	3.44 00 DOWN E)]**0.2 11.35 3.394  Fp (INCH/ 0. 0. 0. NCH/HR) Ap = 0.	NSTREAL 20 53	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.250	SCS CN 32 44 32 56 56	90.00  Tc (MIN.  15.3  26.3 11.3 11.3
INI ELE SUB. * 1 SUB. * 1 SUB. DE RES "3-AGR COM RES "3-MOB SUB. SUB. SUB. SUB. SUB. SUB. SUB. SUB	TIAL SUE VATION I  = K* [(LE AREA ANA 00 YEAR AREA TC LAND U IDENTIAI 4 DWELLI ICULTURA CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI ILE HOME AREA AVE AREA AVE AREA AREA AREA AREA	AREA FLO ATA: UPS ANGTH** 3 ALYSIS US RAINFALL AND LOSS ISE ANGS/ACRE ANGS/A	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  " A OVER A B WIOUS LOSS RA WIOUS LOSS RA WIOUS AREA FF = 25.48 9.62 ED RAINFALL I	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = NCH/HR) = MC II):  AREA (ACRES)  0.96  2.89 0.58 1.54  1.44 2.21  ATE, Fp(I RACTION,  PEAK FLO	3.44 00 DOWN E)]**0.2 11.35 3.394  Fp (INCH/ 0.0 0.0 0.0 NCH/HR) Ap = 0.0 W RATE(C	NSTREAL 20 53  /HR) 98 88 98 .75 .75 .75 .75 .75 .75 .75 .75	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.250 85	SCS CN 32 44 32 56 56 56	90.00  Tc (MIN. 15.3 26.3 11.3 15.3 12.5
INI ELE SUB. * 1 SUB. * 1 SUB. DE RES "3-AGR COM RES "3-MOB SUB. SUB. SUB. SUB. SUB. SUB. SUB. SUB	TIAL SUE VATION I  = K* [(LE AREA ANA 00 YEAR AREA TC LAND U IDENTIAI 4 DWELLI ICULTURA CHARDS" MERCIAL MERCIAL IDENTIAI 4 DWELLI ILE HOME AREA AVE AREA AVE AREA AREA AREA AREA	AREA FLO ATA: UPS ANGTH** 3 ALYSIS US RAINFALL AND LOSS ISE ANGS/ACRE ANGS/A	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVATI ED MINIMUM TO INTENSITY (IN RATE DATA (AN SCS SOII GROUP  "A OVER A B WIOUS LOSS RA VIOUS AREA FF = 25.48 9.62	TON CHANGE (MIN.) = 1595.  TON CHANGE (MIN.) = NCH/HR) = MC II):  AREA (ACRES)  0.96  2.89 0.58 1.54  1.44 2.21  ATE, Fp(I RACTION,  PEAK FLO	3.44 00 DOWN E)]**0.2 11.35 3.394  Fp (INCH/ 0.0 0.0 0.0 NCH/HR) Ap = 0.0 W RATE(C	NSTREAL 20 53  /HR) 98 88 98 .75 .75 .75 .75 .75 .75 .75 .75	Ap (DECIMAL)  0.600  1.000 0.100 0.100 0.250 85	SCS CN 32 44 32 56 56 56	90.00  Tc (MIN. 15.3 26.3 11.3 15.3 12.5

Date: 04/21/2014 File name: LR0107ZZ.RES

Page 2

>>>> (STREET TABLE SECTION # 13 USED) <<<<

\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1585.00 DOWNSTREAM ELEVATION(FEET) = 1580.00 STREET LENGTH (FEET) = 197.50 CURB HEIGHT (INCHES) = 8.0

> Date: 04/21/2014 File name: LR0107ZZ.RES Page 3

```
STREET HALFWIDTH (FEET) = 32.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 64.06 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH (FEET) = 24.54 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.16 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.35 STREET FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 12.82 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.155 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	3.27	0.88	1.000	44
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	A	0.40	0.98	0.600	32
COMMERCIAL	A	1.00	0.98	0.100	32
COMMERCIAL	В	1.80	0.75	0.100	56
MOBILE HOME PARK	В	2.65	0.75	0.250	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В	0.15	0.75	0.600	56
SUBAREA AVERAGE PERVIOUS	LOSS RAT	E, Fp(INC	CH/HR) = 0.	.86	
SUBAREA AVERAGE PERVIOUS	AREA FRA	CTION, Ap	0.490		
SUBAREA AREA(ACRES) =	9.27	SUBAREA	RUNOFF (CFS	s) = 22.8	31
EFFECTIVE AREA(ACRES) =	29.91	AREA-	-AVERAGED Fn	n(INCH/HR)	= 0.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.49

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.31 FLOW VELOCITY (FEET/SEC.) = 5.35 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.61 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10703.00 = 1130.31 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

TOTAL AREA (ACRES) = 29.9 PEAK FLOW RATE (CFS) = 73.64

FLOW PROCESS FROM NODE 10703.00 TO NODE 10704.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 13 USED) <<<< \_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1575.00 STREET LENGTH (FEET) = 303.50 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00

Page 4 Date: 04/21/2014 File name: LR0107ZZ.RES

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.01
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 34.91
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.67
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.55
 STREET FLOW TRAVEL TIME (MIN.) = 1.08 Tc (MIN.) = 13.91
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.005
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                             4.72
                                       0.88
                                               1.000 44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                             2.26
                                       0.98
                                               0.600
                                                     32
 COMMERCIAL
                      A
                               0.25
                                       0.98
                                               0.100 32
                               0.38
                                               0.100 56
 COMMERCIAL
                       В
                                       0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.67
                                       0.75
                                               0.600 56
                              0.62
                                       0.75 0.250 56
 MOBILE HOME PARK
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.698
 SUBAREA AREA(ACRES) = 13.90
                              SUBAREA RUNOFF (CFS) = 30.22
 EFFECTIVE AREA(ACRES) = 43.81 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 43.8 PEAK FLOW RATE (CFS) =
                                                        99.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 37.56
 FLOW VELOCITY (FEET/SEC.) = 4.77 DEPTH*VELOCITY (FT*FT/SEC.) = 3.76
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10704.00 = 1433.81 FEET.
*****************
 FLOW PROCESS FROM NODE 10704.00 TO NODE 10705.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1575.00 DOWNSTREAM ELEVATION(FEET) = 1565.00
```

STREET LENGTH (FEET) = 417.50 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 37.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.53
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 15.11
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.859
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                               Дp
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      A 6.41 0.88
                                                1.000
                                                        44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.58
                                         0.98
                                                0.600
                                                         32
 RESIDENTIAL
                              9.00 0.75 0.600 56
 "3-4 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.728
 SUBAREA AREA (ACRES) = 19.99 SUBAREA RUNOFF (CFS) = 40.31
 EFFECTIVE AREA(ACRES) = 63.80 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 63.8 PEAK FLOW RATE (CFS) = 134.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 39.22
 FLOW VELOCITY (FEET/SEC.) = 5.91 DEPTH*VELOCITY (FT*FT/SEC.) = 4.80
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10705.00 = 1851.31 FEET.
******************
 FLOW PROCESS FROM NODE 10705.00 TO NODE 10706.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1565.00 DOWNSTREAM ELEVATION (FEET) = 1557.00
 STREET LENGTH (FEET) = 423.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
```

Date: 04/21/2014 Page 5 Date: 04/21/2014 File name: LR0107ZZ.RES Page 6 File name: LR010777.RFS

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 153.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 41.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.69
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.91
 STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 16.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.727
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  Aр
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                                4.00
                                          0.88
                                                  1.000
                                                        44
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               2.81
                                          0.63
                                                  1.000
                       В
                                                         6.5
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                                4.90
                                          0.98
                                                 0.600
                                                        32
 RESIDENTIAL
                     в 7.75
                                       0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.740
 SUBAREA AREA(ACRES) = 19.46 SUBAREA RUNOFF(CFS) = 37.28
 EFFECTIVE AREA(ACRES) = 83.26 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.64
 TOTAL AREA(ACRES) = 83.3 PEAK FLOW RATE(CFS) = 164.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.88 HALFSTREET FLOOD WIDTH (FEET) = 42.57
 FLOW VELOCITY (FEET/SEC.) = 5.82 DEPTH*VELOCITY (FT*FT/SEC.) = 5.11
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10706.00 = 2274.81 FEET.
*******************
 FLOW PROCESS FROM NODE 10706.00 TO NODE 10707.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1557.00 DOWNSTREAM ELEVATION(FEET) = 1545.00
 STREET LENGTH (FEET) = 569.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.95
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 188.81
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH (FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 43.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.67
 STREET FLOW TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 17.86
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.587
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                         Fρ
                                                  Αp
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                              0.29
                                          0.88
                                                  1.000
                                                          44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 7.84
                                          0.98
                                                  0.600
                                                          32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                         B 0.50
                                          0.63
                                                 1.000
                                                          6.5
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В 17.69
                                         0.75 0.600
                                                          56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.612
 SUBAREA AREA(ACRES) = 26.32
                                SUBAREA RUNOFF (CFS) = 49.49
 EFFECTIVE AREA(ACRES) = 109.58 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 109.6
                                PEAK FLOW RATE (CFS) = 203.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 44.47
 FLOW VELOCITY (FEET/SEC.) = 6.44 DEPTH*VELOCITY (FT*FT/SEC.) = 5.90
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 569.0 FT WITH ELEVATION-DROP = 12.0 FT, IS 68.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10707.00
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10707.00 = 2843.81 FEET.
FLOW PROCESS FROM NODE 10707.00 TO NODE 10708.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1545.00 DOWNSTREAM ELEVATION(FEET) = 1528.00
 STREET LENGTH (FEET) = 629.53 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

File name: LR0107ZZ.RES

Page 8

Date: 04/21/2014

Date: 04/21/2014 File name: LR0107ZZ.RES Page 7

```
STREET FLOW DEPTH(FEET) = 0.91
   HALFSTREET FLOOD WIDTH (FEET) = 44.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.69
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 19.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.469
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                        Fp
                                                    Αp
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.85 0.98 0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 23.63 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.79
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 29.48 SUBAREA RUNOFF(CFS) = 52.89
 EFFECTIVE AREA(ACRES) = 139.06 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 139.1 PEAK FLOW RATE (CFS) = 244.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.93 HALFSTREET FLOOD WIDTH(FEET) = 45.20
 FLOW VELOCITY (FEET/SEC.) = 7.45 DEPTH*VELOCITY (FT*FT/SEC.) = 6.93
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 28.35
 PIPE-FLOW(CFS) = 89.15
 PIPEFLOW TRAVEL TIME (MIN.) = 0.37 Tc (MIN.) = 18.23
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.555
 SUBAREA AREA (ACRES) = 29.48 SUBAREA RUNOFF (CFS) = 55.16
 TOTAL AREA (ACRES) = 139.1 PEAK FLOW RATE (CFS) = 255.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 165.95
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.84
   HALFSTREET FLOOD WIDTH (FEET) = 40.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.55
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10708.00 = 3473.34 FEET.
*****************
 FLOW PROCESS FROM NODE 10708.00 TO NODE 10709.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
```

```
STREET LENGTH (FEET) = 804.06 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 32.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.93
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     290.68
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.00
 HALFSTREET FLOOD WIDTH (FEET) = 48.86
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.32
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.35
STREET FLOW TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 20.06
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.412
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A 11.14 0.98
                                                   0.600
                                                           32
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 29.89 0.75 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA (ACRES) = 41.03 SUBAREA RUNOFF (CFS) = 71.14
EFFECTIVE AREA(ACRES) = 180.09 AREA-AVERAGED Fm(INCH/HR) = 0.51
AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.62
TOTAL AREA (ACRES) = 180.1 PEAK FLOW RATE (CFS) = 308.40
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.21
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.02 HALFSTREET FLOOD WIDTH(FEET) = 49.72
FLOW VELOCITY (FEET/SEC.) = 7.45 DEPTH*VELOCITY (FT*FT/SEC.) = 7.61
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.93
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 27.92
PIPE-FLOW(CFS) = 111.13
PIPEFLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 18.71
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.515
SUBAREA AREA(ACRES) = 41.03 SUBAREA RUNOFF(CFS) = 74.95
TOTAL AREA(ACRES) = 180.1 PEAK FLOW RATE(CFS) = 325.10
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

File name: LR0107ZZ.RES

Page 10

Date: 04/21/2014

UPSTREAM ELEVATION(FEET) = 1528.00 DOWNSTREAM ELEVATION(FEET) = 1510.00

Date: 04/21/2014 File name: LR0107ZZ.RES Page 9

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.21
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 213.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.92
   HALFSTREET FLOOD WIDTH (FEET) = 44.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.17
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10709.00 = 4277.40 FEET.
******************
 FLOW PROCESS FROM NODE 10709.00 TO NODE 10710.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1495.00
 STREET LENGTH (FEET) = 848.55 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 365.36
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.11
   HALFSTREET FLOOD WIDTH (FEET) = 54.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.98
 STREET FLOW TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 20.68
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.369
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                Αp
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 19.57
                                                 0.600 32
                                         0.98
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 28.41 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 47.98 SUBAREA RUNOFF(CFS) = 80.51
 EFFECTIVE AREA(ACRES) = 228.07 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 228.1 PEAK FLOW RATE (CFS) = 381.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
DEPTH(FEET) = 1.13 HALFSTREET FLOOD WIDTH(FEET) = 55.09
 FLOW VELOCITY (FEET/SEC.) = 7.25 DEPTH*VELOCITY (FT*FT/SEC.) = 8.18
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 28.37
 PIPE-FLOW(CFS) = 168.64
 PIPEFLOW TRAVEL TIME (MIN.) = 0.50 Tc (MIN.) = 19.20
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.476
 SUBAREA AREA (ACRES) = 47.98 SUBAREA RUNOFF (CFS) = 85.14
 TOTAL AREA(ACRES) = 228.1 PEAK FLOW RATE(CFS) = 403.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.62
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 235.22
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.98
   HALFSTREET FLOOD WIDTH (FEET) = 47.52
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.19
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10710.00 = 5125.95 FEET.
*******************
 FLOW PROCESS FROM NODE 10710.00 TO NODE 10711.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1495.00 DOWNSTREAM ELEVATION(FEET) = 1483.00
 STREET LENGTH (FEET) = 720.09 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    422.31
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.17
   HALFSTREET FLOOD WIDTH (FEET) = 57.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.57
 STREET FLOW TRAVEL TIME (MIN.) = 1.64 Tc (MIN.) = 20.85
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.357
 SUBAREA LOSS RATE DATA (AMC II):
```

File name: LR0107ZZ.RES

Page 12

Date: 04/21/2014

Date: 04/21/2014 File name: LR0107ZZ.RES Page 11

```
DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                         Fρ
                                                          SCS
                                                   Αр
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
      LAND USE
 RESIDENTIAL
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE" B 9.73 0.75 0.600 56
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 RESIDENTIAL
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 "3-4 DWELLINGS/ACRE" A 12.66 0.98 0.600 32
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SUBAREA AREA (ACRES) = 22.39 SUBAREA RUNOFF (CFS) = 36.90
                                                                                      ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 250.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.61
                                                                                      STREET FLOW DEPTH(FEET) = 1.61
 TOTAL AREA (ACRES) = 250.5 PEAK FLOW RATE (CFS) = 416.31
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 73.18
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.56
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 5.02 Tc (MIN.) = 24.63
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.132
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 1.17 HALFSTREET FLOOD WIDTH(FEET) = 57.10
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fp
                                                                                                                                             SCS
 FLOW VELOCITY (FEET/SEC.) = 7.28 DEPTH*VELOCITY (FT*FT/SEC.) = 8.51
                                                                                        LAND USE
                                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    RESIDENTIAL
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                    "3-4 DWELLINGS/ACRE"
                                                                                                            A 31.83
                                                                                                                             0.98
                                                                                                                                     0.600
                                                                                                                                              32
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
                                                                                    AGRICULTURAL FAIR COVER
                                                                                    "ORCHARDS"
                                                                                                          A 45.08
                                                                                                                                    1.000
                                                                                                                                             44
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                                                             0.88
                                                                                                          A
                                                                                                                  4.20
                                                                                                                             0.98
                                                                                                                                     0.850
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                    PUBLIC PARK
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                    SCHOOL
                                                                                                          A
                                                                                                                  1.83
                                                                                                                             0.98
                                                                                                                                     0.600
                                                                                                                                             32
 ASSUME FULL-FLOWING PIPELINE
                                                                                    RESIDENTIAL
                                                                                    "3-4 DWELLINGS/ACRE" B 18.12
 PIPE-FLOW VELOCITY (FEET/SEC.) = 29.19
                                                                                                                             0.75
                                                                                                                                     0.600
                                                                                                          B
                                                                                                                  0.93
                                                                                                                            0.75 0.600 56
 PIPE-FLOW(CFS) = 206.51
                                                                                    SCHOOL
 PIPEFLOW TRAVEL TIME (MIN.) = 0.41 Tc (MIN.) = 19.62
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.445
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.787
 SUBAREA AREA(ACRES) = 22.39 SUBAREA RUNOFF(CFS) = 38.67
                                                                                    SUBAREA AREA(ACRES) = 101.99 SUBAREA RUNOFF(CFS) = 131.49
 TOTAL AREA (ACRES) = 250.5 PEAK FLOW RATE (CFS) = 436.11
                                                                                    EFFECTIVE AREA(ACRES) = 352.45 AREA-AVERAGED Fm(INCH/HR) = 0.57
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    TOTAL AREA (ACRES) = 352.5 PEAK FLOW RATE (CFS) = 497.19
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.90
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 229.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    DEPTH (FEET) = 1.60 HALFSTREET FLOOD WIDTH (FEET) = 72.87
   STREET FLOW DEPTH (FEET) = 0.98
   HALFSTREET FLOOD WIDTH (FEET) = 47.58
                                                                                    FLOW VELOCITY (FEET/SEC.) = 4.69 DEPTH*VELOCITY (FT*FT/SEC.) = 7.53
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.17
                                                                                    *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.03
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10711.00 = 5846.04 FEET.
                                                                                          THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
*******************
                                                                                    ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 FLOW PROCESS FROM NODE 10711.00 TO NODE 10712.00 IS CODE = 63
                                                                                    ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
______
                                                                                    DEPTH OF FLOW IN 63.0 INCH PIPE IS 48.6 INCHES
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    PIPE-FLOW VELOCITY (FEET/SEC.) = 24.34
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                    PIPE-FLOW(CFS) = 436.11
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 20.58
______
 UPSTREAM ELEVATION(FEET) = 1483.00 DOWNSTREAM ELEVATION(FEET) = 1477.00
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.375
 STREET LENGTH (FEET) = 1414.25 CURB HEIGHT (INCHES) = 8.0
                                                                                    SUBAREA AREA(ACRES) = 101.99 SUBAREA RUNOFF(CFS) = 153.76
                                                                                    TOTAL AREA(ACRES) = 352.5
 STREET HALFWIDTH (FEET) = 26.00
                                                                                                                    PEAK FLOW RATE (CFS) = 574.17
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.90
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
```

Date: 04/21/2014 File name: LR0107ZZ.RES Page 13 Date: 04/21/2014 File name: LR0107ZZ.RES Page 14

```
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                     EFFECTIVE AREA(ACRES) = 537.94 AREA-AVERAGED Fm(INCH/HR) = 0.65
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 138.06
                                                                                     AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.74
   ***STREET FLOWING FULL***
                                                                                     TOTAL AREA (ACRES) = 537.9 PEAK FLOW RATE (CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.04
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.46
   HALFSTREET FLOOD WIDTH (FEET) = 44.67
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.48
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.62
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     DEPTH(FEET) = 1.51 HALFSTREET FLOOD WIDTH(FEET) = 68.42
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1414.2 FT WITH ELEVATION-DROP = 6.0 FT, IS 143.2 CFS,
                                                                                     FLOW VELOCITY (FEET/SEC.) = 7.82 DEPTH*VELOCITY (FT*FT/SEC.) = 11.85
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10712.00
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10712.00 = 7260.29 FEET.
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
*****************
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 FLOW PROCESS FROM NODE 10712.00 TO NODE 10713.00 IS CODE = 63
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
______
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                     DEPTH OF FLOW IN 57.0 INCH PIPE IS 43.7 INCHES
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 39.36
_____
                                                                                     PIPE-FLOW(CFS) = 574.17
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 21.28
 UPSTREAM ELEVATION (FEET) = 1477.00 DOWNSTREAM ELEVATION (FEET) = 1456.00
 STREET LENGTH (FEET) = 1655.07 CURB HEIGHT (INCHES) = 8.0
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.328
 STREET HALFWIDTH (FEET) = 26.00
                                                                                     SUBAREA AREA (ACRES) = 185.49 SUBAREA RUNOFF (CFS) = 253.64
                                                                                     TOTAL AREA(ACRES) = 537.9
                                                                                                                    PEAK FLOW RATE (CFS) = 812.82
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.46
                                                                                     *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 238.66
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                      ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                      STREET FLOW DEPTH (FEET) = 1.04
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 44.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 686.96
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.01
   ***STREET FLOWING FULL***
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.25
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
                                                                                           AND L = 1655.1 FT WITH ELEVATION-DROP = 21.0 FT, IS 279.3 CFS,
   STREET FLOW DEPTH(FEET) = 1.48
   HALFSTREET FLOOD WIDTH (FEET) = 66.83
                                                                                           WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10713.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.71
                                                                                     LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10713.00 = 8915.36 FEET.
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 11.44
                                                                                   ******************
 STREET FLOW TRAVEL TIME (MIN.) = 3.58 Tc (MIN.) = 24.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.157
                                                                                     FLOW PROCESS FROM NODE 10713.00 TO NODE 10714.00 IS CODE = 63
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    >>>> (STREET TABLE SECTION # 5 USED) <<<<
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   _____
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               94.94
                                          0.88
                                                  1.000
                                                         44
                                                                                     UPSTREAM ELEVATION(FEET) = 1456.00 DOWNSTREAM ELEVATION(FEET) = 1425.00
                        A 55.36
                                                   0.850 32
                                                                                     STREET LENGTH (FEET) = 2081.11 CURB HEIGHT (INCHES) = 6.0
                                          0.98
 PUBLIC PARK
                                                                                     STREET HALFWIDTH (FEET) = 18.00
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       A 14.22
                                           0.98
                                                   0.600
                                                         32
                                                   0.600 32
 SCHOOL
                                11.27
                                          0.98
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 AGRICULTURAL FAIR COVER
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "ORCHARDS"
                               7.08
                                          0.63
                                                  1.000
                                                         65
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                               2.62
                                          0.75
                                                  0.600
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.895
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AREA(ACRES) = 185.49
                                SUBAREA RUNOFF(CFS) = 225.18
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

Date: 04/21/2014

File name: LR0107ZZ.RES

730.27

Page 16

Date: 04/21/2014 File name: LR0107ZZ.RES Page 15

STREET FLOW DEPTH (FEET) = 1.64

HALFSTREET FLOOD WIDTH (FEET) = 74.84

AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.69

PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 14.22

STREET FLOW TRAVEL TIME (MIN.) = 3.99 Tc (MIN.) = 25.28

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.100

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE PUBLIC PARK A 76.60 0.98 0.850 32 73.07 0.100 32 COMMERCIAL Α 0.98 AGRICULTURAL FAIR COVER A 49.11 "ORCHARDS" 0.88 1.000 44 PUBLIC PARK В 12.69 0.75 0.850 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 15.53 0.75 0.600 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 13.69 0.75 0.600 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.623

SUBAREA AREA(ACRES) = 240.69 SUBAREA RUNOFF (CFS) = 333.35

EFFECTIVE AREA(ACRES) = 778.63 AREA-AVERAGED Fm(INCH/HR) = 0.62

AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.71

TOTAL AREA (ACRES) = 778.6 PEAK FLOW RATE (CFS) = 1035.72

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.00

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 1.67 HALFSTREET FLOOD WIDTH(FEET) = 76.54

FLOW VELOCITY (FEET/SEC.) = 8.78 DEPTH\*VELOCITY (FT\*FT/SEC.) = 14.68

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN

THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70

SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:

\*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\*

ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1

DEPTH OF FLOW IN 63.0 INCH PIPE IS 48.4 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 45.59

PIPE-FLOW(CFS) = 812.82

PIPEFLOW TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 22.05

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.279

SUBAREA AREA (ACRES) = 240.69 SUBAREA RUNOFF (CFS) = 372.25

TOTAL AREA(ACRES) = 778.6 PEAK FLOW RATE (CFS) = 1161.57

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.00

File name: LR010777.RFS

\*NOTE: STREET-CAPACITY MAY BE EXCEEDED\*

STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :

STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 348.75

\*\*\*STREET FLOWING FULL\*\*\*

Date: 04/21/2014

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 1.14

Page 17

979.55

```
HALFSTREET FLOOD WIDTH (FEET) = 49.75
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.88
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
      AND L = 2081.1 FT WITH ELEVATION-DROP = 31.0 FT, IS 501.0 CFS,
      WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10714.00
 LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10714.00 = 10996.47 FEET.
******************
 FLOW PROCESS FROM NODE 10713.00 TO NODE 10714.00 IS CODE = 71
______
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
```

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.39:30M= 0.81:1H= 1.06:3H= 1.73:6H= 2.35:24H= 5.21

\_\_\_\_\_\_

S-GRAPH: VALLEY (DEV.) = 71.2%; VALLEY (UNDEV.) / DESERT = 28.8%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.37; LAG(HR) = 0.29; Fm(INCH/HR) = 0.62; Ybar = 0.65

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00

UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 778.6

LONGEST FLOWPATH FROM NODE 10700.00 TO NODE 10714.00 = 10996.47 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0256; Lca/L=0.4,n=.0229; Lca/L=0.5,n=.0211;Lca/L=0.6,n=.0197

TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 138.49

UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 933.23

TOTAL PEAK FLOW RATE (CFS) = 933.23 (SOURCE FLOW INCLUDED)

RATIONAL METHOD PEAK FLOW RATE(CFS) = 1161.57

(UPSTREAM NODE PEAK FLOW RATE (CFS) = 1161.57)

PEAK FLOW RATE (CFS) USED = 1161.57

\_\_\_\_\_ END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 778.6 TC (MIN.) = 22.05

AREA-AVERAGED Fm(INCH/HR) = 0.62 Ybar = 0.65

PEAK FLOW RATE (CFS) = 1161.57

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0107ZZ.RES Page 18 Date: 04/21/2014 File name: LR0107ZZ.RES Page 19 \*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10811 (FILE LR0108ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

FILE NAME: LR0108ZZ.DAT

TIME/DATE OF STUDY: 14:34 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 9 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 2.00 0.0312 0.167 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 1.5 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

```
17 20.0
            10.0
                   0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180
18 26.0
            15.0
                   0.020/0.020/0.020
                                    0.67
                                            2.00 0.0312 0.167 0.0180
19 52.0
            20.0
                 0.020/0.020/0.020 0.67
                                            2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
      as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
   WATERSHED LAG = 0.80 * Tc
   USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF
   1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH
   FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE.
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
*******************
 FLOW PROCESS FROM NODE 10800.00 TO NODE 10801.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 763.91
 ELEVATION DATA: UPSTREAM(FEET) = 1485.00 DOWNSTREAM(FEET) = 1477.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.592
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.920
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  αA
                                                            Tc
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                                 4.06
                                         0.98
                                                 0.600
                                                         32 14.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 8.53
 TOTAL AREA (ACRES) = 4.06 PEAK FLOW RATE (CFS) =
                                                     8.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 10801.00 TO NODE 10802.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1477.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1475.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 348.45
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
       Date: 04/21/2014
                        File name: LR010877.RFS
                                                        Page 2
```

Date: 04/21/2014 File name: LR0108ZZ.RES Page 1

```
MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.674
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                               αA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.83
                                        0.75
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.90
                                        0.98
                                                0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.21
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.52
 AVERAGE FLOW DEPTH(FEET) = 0.58 FLOOD WIDTH(FEET) = 29.96
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.31 Tc (MIN.) = 16.90
 SUBAREA AREA(ACRES) = 2.73 SUBAREA RUNOFF(CFS) = 5.36
 EFFECTIVE AREA(ACRES) = 6.79 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 6.8 PEAK FLOW RATE (CFS) = 12.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.60 FLOOD WIDTH(FEET) = 32.35
 FLOW VELOCITY(FEET/SEC.) = 2.55 DEPTH*VELOCITY(FT*FT/SEC) = 1.53
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10802.00 = 1112.36 FEET.
******************
 FLOW PROCESS FROM NODE 10802.00 TO NODE 10803.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1475.00 DOWNSTREAM ELEVATION(FEET) = 1470.00
 STREET LENGTH (FEET) = 395.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.70
 STREET FLOW TRAVEL TIME (MIN.) = 2.11 Tc (MIN.) = 19.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.492
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
```

```
LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В 1.16
                                         0.75
                                                0.600
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 11.90 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.95
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 13.06 SUBAREA RUNOFF(CFS) = 22.55
 EFFECTIVE AREA(ACRES) = 19.85 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 19.8 PEAK FLOW RATE (CFS) =
                                                         34.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.04
 FLOW VELOCITY (FEET/SEC.) = 3.41 DEPTH*VELOCITY (FT*FT/SEC.) = 2.04
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10803.00 = 1507.36 FEET.
******************
 FLOW PROCESS FROM NODE 10803.00 TO NODE 10804.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1470.00 DOWNSTREAM ELEVATION (FEET) = 1465.00
 STREET LENGTH (FEET) = 436.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.35
 STREET FLOW TRAVEL TIME (MIN.) = 2.05 Tc (MIN.) = 21.05
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.343
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                               15.25 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 15.25 SUBAREA RUNOFF (CFS) = 24.13
 EFFECTIVE AREA(ACRES) = 35.10 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.60
       Date: 04/21/2014 File name: LR0108ZZ.RES
                                                       Page 4
```

Date: 04/21/2014 File name: LR0108ZZ.RES Page 3

```
TOTAL AREA (ACRES) = 35.1 PEAK FLOW RATE (CFS) = 55.90
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.82
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                        AND L = 800.1 FT WITH ELEVATION-DROP = 5.0 FT, IS 63.1 CFS,
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10805.00
                                                                                  LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10805.00 = 2743.42 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 ********************
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.81
 FLOW VELOCITY (FEET/SEC.) = 3.69 DEPTH*VELOCITY (FT*FT/SEC.) = 2.59
                                                                                   FLOW PROCESS FROM NODE 10805.00 TO NODE 10806.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10804.00 = 1943.36 FEET.
                                                                                 ______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                                  >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                 _____
 FLOW PROCESS FROM NODE 10804.00 TO NODE 10805.00 IS CODE = 63
                                                                                   UPSTREAM ELEVATION (FEET) = 1460.00 DOWNSTREAM ELEVATION (FEET) = 1420.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 1682.03 CURB HEIGHT (INCHES) = 8.0
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 32.00
______
 UPSTREAM ELEVATION(FEET) = 1465.00 DOWNSTREAM ELEVATION(FEET) = 1460.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 STREET LENGTH (FEET) = 800.06 CURB HEIGHT (INCHES) = 8.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                    STREET FLOW DEPTH (FEET) = 0.80
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 38.50
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.79
   ***STREET FLOWING FULL***
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.61
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 4.84 Tc (MIN.) = 30.17
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.83
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.888
   HALFSTREET FLOOD WIDTH (FEET) = 40.19
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.12
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fp
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.59
                                                                                       LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 4.27 Tc (MIN.) = 25.33
                                                                                  MOBILE HOME PARK
                                                                                                       A 25.95 0.98 0.250
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.097
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" A 16.72 0.98 0.600
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Аp
                                                                                                        A 14.61 0.98 0.600 32
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.441
 "3-4 DWELLINGS/ACRE"
                     A 12.48
                                         0.98
                                                 0.600 32
                                                                                   SUBAREA AREA (ACRES) = 57.28 SUBAREA RUNOFF (CFS) = 75.15
                                                                                  EFFECTIVE AREA(ACRES) = 119.25 AREA-AVERAGED Fm(INCH/HR) = 0.48
                       A
                              9.98
                                         0.98
                                                 0.250 32
 MOBILE HOME PARK
                                4.41
                                         0.98 0.600
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                   TOTAL AREA (ACRES) = 119.2 PEAK FLOW RATE (CFS) = 151.26
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.470
 SUBAREA AREA(ACRES) = 26.87 SUBAREA RUNOFF(CFS) = 39.63
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 61.97 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 62.0 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 40.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.13 DEPTH*VELOCITY (FT*FT/SEC.) = 5.12
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                        AND L = 1682.0 FT WITH ELEVATION-DROP = 40.0 FT, IS 133.1 CFS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 10806.00
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 41.72
                                                                                  LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10806.00 = 4425.45 FEET.
```

Date: 04/21/2014 File name: LR0108ZZ.RES Page 5 Date: 04/21/2014 File name: LR0108ZZ.RES Page 6

αA

32

LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10807.00 = 6137.48 FEET.

FLOW PROCESS FROM NODE 10007.00 TO NODE 10006.00 TS CODE = 05

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 18 USED)

UPSTREAM ELEVATION(FEET) = 1392.00 DOWNSTREAM ELEVATION(FEET) = 1388.00 STREET LENGTH(FEET) = 1412.25 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 26.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 261.11
\*\*\*STREET FLOWING FULL\*\*\*
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 1.38
HALFSTREET FLOOD WIDTH(FEET) = 61.46
AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.47
PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.77

STREET FLOW TRAVEL TIME(MIN.) = 6.79 Tc(MIN.) = 41.95 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.549

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL

"3-4 DWELLINGS/ACRE" A 86.38 0.98 0.600 32
MOBILE HOME PARK A 40.31 0.98 0.250 32
RESIDENTIAL

"3-4 DWELLINGS/ACRE" B 4.86 0.75 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.96
SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.493
SUBAREA AREA (ACRES) = 131.55 SUBAREA RUNOFF(CFS) = 127.15

EFFECTIVE AREA (ACRES) = 308.31 AREA-AVERAGED Fm(INCH/HR) = 0.48
AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.49

TOTAL AREA (ACRES) = 308.3 PEAK FLOW RATE (CFS) = 297.06

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN

THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07

SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:

\*\* PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE \*\*

ESTIMATED PIPE DIAMETER(INCH) = 72.00 NUMBER OF PIPES = 1

DEPTH OF FLOW IN 72.0 INCH PIPE IS 56.0 INCHES

PIPE-FLOW VELOCITY(FEET/SEC.) = 8.36

PIPE-FLOW(CFS) = 197.46

PIPEFLOW TRAVEL TIME(MIN.) = 2.81 TC(MIN.) = 37.98

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.645

Page 8

```
SUBAREA AREA (ACRES) = 131.55 SUBAREA RUNOFF (CFS) = 138.44
 TOTAL AREA (ACRES) = 308.3
                              PEAK FLOW RATE (CFS) = 323.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 126.07
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.08
   HALFSTREET FLOOD WIDTH (FEET) = 46.57
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.92
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.15
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1412.2 FT WITH ELEVATION-DROP = 4.0 FT, IS 231.9 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10808.00
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10808.00 = 7549.73 FEET.
******************
 FLOW PROCESS FROM NODE 10808.00 TO NODE 10809.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1388.00 DOWNSTREAM ELEVATION(FEET) = 1384.00
 STREET LENGTH (FEET) = 1356.38 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                 391.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.57
   HALFSTREET FLOOD WIDTH (FEET) = 71.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.07
 STREET FLOW TRAVEL TIME (MIN.) = 5.85 Tc (MIN.) = 43.83
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.509
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                         Fρ
                                                  αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.18
                                         0.75
                                                  0.600
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 100.00
                                         0.98
                                                 0.600
                                                         32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 56.51
                                         0.98
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 162.69
                                 SUBAREA RUNOFF (CFS) = 136.08
 EFFECTIVE AREA(ACRES) = 471.00 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.53
 TOTAL AREA(ACRES) = 471.0
                                  PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.51
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.62 HALFSTREET FLOOD WIDTH(FEET) = 73.42
 FLOW VELOCITY (FEET/SEC.) = 3.92 DEPTH*VELOCITY (FT*FT/SEC.) = 6.33
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 87.0 INCH PIPE IS 65.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.65
 PIPE-FLOW(CFS) =
                    323.53
 PIPEFLOW TRAVEL TIME (MIN.) = 2.34 Tc (MIN.) = 40.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.587
 SUBAREA AREA(ACRES) = 162.69 SUBAREA RUNOFF(CFS) = 147.43
 TOTAL AREA (ACRES) = 471.0
                                  PEAK FLOW RATE (CFS) = 454.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.51
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 131.34
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.09
   HALFSTREET FLOOD WIDTH (FEET) = 46.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 1356.4 FT WITH ELEVATION-DROP = 4.0 FT, IS 235.0 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10809.00
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10809.00 = 8906.11 FEET.
*******************
 FLOW PROCESS FROM NODE 10809.00 TO NODE 10810.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1384.00 DOWNSTREAM ELEVATION(FEET) = 1382.00
 STREET LENGTH (FEET) = 1169.35 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

File name: LR0108ZZ.RES

Page 10

Date: 04/21/2014

Date: 04/21/2014 File name: LR0108ZZ.RES Page 9

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 1.91
 HALFSTREET FLOOD WIDTH (FEET) = 87.95
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.31
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.32
STREET FLOW TRAVEL TIME (MIN.) = 5.88 Tc (MIN.) = 46.20
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.462
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                          Fр
                                                           SCS
                                                    Αp
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                     A 85.15
"3-4 DWELLINGS/ACRE"
                                           0.98
                                                 0.600
RESIDENTIAL
                     B 51.42 0.75 0.600 56
"3-4 DWELLINGS/ACRE"
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA(ACRES) = 136.57
                                 SUBAREA RUNOFF (CFS) = 114.13
EFFECTIVE AREA(ACRES) = 607.57 AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.55
TOTAL AREA(ACRES) = 607.6 PEAK FLOW RATE(CFS) = 516.23
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.66
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.91 HALFSTREET FLOOD WIDTH(FEET) = 88.25
FLOW VELOCITY (FEET/SEC.) = 3.32 DEPTH*VELOCITY (FT*FT/SEC.) = 6.34
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 108.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 108.0 INCH PIPE IS 84.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 8.52
PIPE-FLOW(CFS) = 454.86
PIPEFLOW TRAVEL TIME (MIN.) = 2.29 Tc (MIN.) = 42.61
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.535
SUBAREA AREA (ACRES) = 136.57 SUBAREA RUNOFF (CFS) = 123.08
TOTAL AREA(ACRES) = 607.6
                              PEAK FLOW RATE (CFS) = 556.03
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.66
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 101.17
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 1.09
 HALFSTREET FLOOD WIDTH (FEET) = 47.18
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.28
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.49
```

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

```
AND L = 1169.3 FT WITH ELEVATION-DROP = 2.0 FT, IS 195.1 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10810.00
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10810.00 = 10075.46 FEET.
FLOW PROCESS FROM NODE 10810.00 TO NODE 10811.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1382.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1350.00
 FLOW LENGTH (FEET) = 1164.14 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.59
 PIPE-FLOW(CFS) = 513.39
 PIPEFLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 43.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.516
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                                67.01
                                         0.88
                                                 1.000
                                                         44
                         Α
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        A 27.08
                                         0.98
                                                 0.600
                                                         32
 AGRICULTURAL FAIR COVER
                               32.87
 "ORCHARDS"
                                         0.63
                                                1.000
                                                         6.5
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.20
                                         0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.914
 SUBAREA AREA (ACRES) = 127.16 SUBAREA RUNOFF (CFS) = 87.44
 EFFECTIVE AREA(ACRES) = 734.73 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 734.7 PEAK FLOW RATE (CFS) =
                                                      633.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.79
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                             STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 119.63
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.51
```

\*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

Date: 04/21/2014 File name: LR0108ZZ.RES Page 11 Date: 04/21/2014 File name: LR0108ZZ.RES Page 12

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.92
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 1164.1 FT WITH ELEVATION-DROP = 32.0 FT, IS 253.0 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 10811.00
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10811.00 = 11239.60 FEET.
*******************
 FLOW PROCESS FROM NODE 10810.00 TO NODE 10811.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.03;6H= 2.75;24H= 5.58
 S-GRAPH: VALLEY (DEV.) = 86.4%; VALLEY (UNDEV.) / DESERT= 13.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.73; LAG(HR) = 0.58; Fm(INCH/HR) = 0.56; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 10800.00 TO NODE 10811.00 = 11239.60 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0473; Lca/L=0.4,n=.0424; Lca/L=0.5,n=.0390; Lca/L=0.6,n=.0364
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 158.96
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 709.47
 TOTAL PEAK FLOW RATE (CFS) = 709.47 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 633.03
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 633.03)
 PEAK FLOW RATE (CFS) USED = 709.47
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 734.7 TC (MIN.) =
                                           43.50
 AREA-AVERAGED Fm(INCH/HR) = 0.56 Ybar = 0.58
 PEAK FLOW RATE (CFS) = 709.47
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0108ZZ.RES Page 13 Date: 04/21/2014 File name: LR0108ZZ.RES Page 14

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10911 (FILE LR0109ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0109ZZ.DAT

TIME/DATE OF STUDY: 14:35 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2490

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

ΙJ	52.0	15.0 20.0	0.020/0.02 0.020/0.02 0.020/0.02	0/0.020 0/0.020	0.67	2.00 0 2.00 0	.0312 0.	.125 .167 .167	0.0180
2 *SI OF	l. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T	ve Flow-I ximum All )*(Veloci WITH A FI O THE UPS	DEPTH CONSTR. Depth = 0.2 .owable Streety) Constra .oW CAPACITY STREAM TRIBU	O FEET et Flow D int = 6. GREATER TARY PIPE	0 (FT*F7 THAN .*	r/S)		ΓED	
V U 1 E E	WATERSHED JSED "VAI L UNITS/A FOR DEVEI PRECIPITA SIERRA MA	LAG = 0. LEY UNDEN CRE AND I OPMENTS O TION DATA DRE DEPTH	EL SELECTION. 80 * TC "ELOPED" S-G. ESS; AND "V. F 2 UNITS/A A ENTERED ON I-AREA FACTO. CONDITION (.	RAPH FOR ALLEY DEV CRE AND M SUBAREA RS USED.	DEVELOPM ELOPED" ORE. BASIS.	S-GRAPH		карн і	METHOD*
	OW PROCES	S FROM NO	**************************************	0 TO NODE	10901.	.00 IS C			*****
			TRATION NOM						
	ITIAL SUE	AREA FLOW		T) = 95	2.49	STREAM(	======= FEET) =	13	78.00
TC SUE * 1 SUE DE	ITIAL SUE EVATION [  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN	AREA FLOW ATA: UPST NGTH** 3. LYSIS USE RAINFALL AND LOSS T TYPE/	W-LENGTH (FEET) TREAM (FEET)  OO) / (ELEVAT D MINIMUM TI INTENSITY (II RATE DATA (AI SCS SOI	T) = 95 = 1385. ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA	2.49 00 DOWN E)]**0.2 17.10 2.652	20	Ар	SCS	Tc
TC SUE * 1 SUE DE RES	ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL	AREA FLOW NGTH** 3. LYSIS USE RAINFALL AND LOSS T TYPE/ SE	V-LENGTH (FEE' PREAM (FEET)  OO) / (ELEVAT  DO MINIMUM TO INTENSITY (I)  RATE DATA (A)  SCS SOIT  GROUP	T) = 95 = 1385. ION CHANG c(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	2.49 00 DOWN E)]**0.2 17.10 2.652 Fp (INCH/	20 08 'HR) (D	Ap ECIMAL)	SCS CN	Tc (MIN.)
TC SUE * 1 SUE DE DE SUE SUE SUE SUE	ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U LAND U BAREA TA -4 DWELLI BALIC PARK BAREA AVE BAREA AVE BAREA RUN	AREA FLOW ATA: UPST  NGTH** 3. LYSIS USE RAINFALL AND LOSS T TYPE/ ISE  NGS/ACRE' IRAGE PERV RAGE PERV RAGE PERV	W-LENGTH (FEE' PREAM (FEET)  OO) / (ELEVAT  D MINIMUM TINTENSITY (II  RATE DATA (AI  SCS SOII  GROUP  A  A  VIOUS LOSS R  VIOUS AREA F  = 17.10	I) = 95 = 1385. ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 5.69 3.97 ATE, Fp(I RACTION,	2.49 00 DOWN E)]**0.2 17.10 2.652 Fp (INCH/ 0. NCH/HR) Ap = 0.	/HR) (D .98 .98 .98 = 0.98	Ap ECIMAL) 0.600 0.850	SCS CN 32 32	Tc (MIN.)
TC SUE * 1 SUE DE RESS "3-PUE SUE SUE TOTO	ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI BALC PARK BAREA AVE BAREA AVE BAREA RUN TAL AREA ( BAREA AREA	AREA FLOW ATA: UPST  NGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ SE  NGS/ACRE' ERAGE PERV RAGE PERV	VILENGTH (FEE')  OO) / (ELEVAT  DO MINIMUM TO INTENSITY (INTENSITY	I) = 95 = 1385.  ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  5.69 3.97 ATE, Fp(I RACTION, PEAK FLO DEPTH(INC	2.49 00 DOWN E)]**0.2 17.1( 2.652 Fp (INCH/ 0. NCH/HR) Ap = 0. W RATE((CH):	(HR) (D .98 .98 .98 = 0.98 .703	Ap ECIMAL) 0.600 0.850	SCS CN 32 32	Tc (MIN.) 17.11 20.06
TC SUE * 1 SUE DE RES "3- PUE SUE SUE TOT SUE 5M	ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI BALC PARK BAREA AVE BAREA ARE = 0.31;	AREA FLOW ATA: UPST  NGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ SE  NGS/ACRE' ERAGE PERV OFF(CFS) ACRES) = A-AVERAGE 30M = 0.6	W-LENGTH (FEE' PREAM (FEET)  OO) / (ELEVAT  D MINIMUM TINTENSITY (II  RATE DATA (AI  SCS SOII  GROUP  A  A  VIOUS LOSS R  VIOUS AREA F  = 17.10  9.66  D RAINFALL	T) = 95 = 1385.  ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  5.69 3.97 ATE, Fp(I RACTION, PEAK FLO DEPTH(INC 85; 3HR =	2.49 00 DOWN  E)]**0.2 17.1( 2.652  Fp (INCH/  0. NCH/HR) Ap = 0. W RATE(( H): 1.39; (	20 08 /HR) (D .98 .98 = 0.98 .703 CFS) =	Ap ECIMAL) 0.600 0.850 17.10	SCS CN 32 32 32	Tc (MIN.) 17.11 20.06
TC SUE * 1 SUE DE RES SUE SUE SUE SUE SUE SUE SUE SUE SUE S	ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.31;  ********** DW PROCES	AREA FLOW ATA: UPST  INGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ ISE INGS/ACRE' INGS/ACRE' INGS/ACRE' INGS/ACRE' INGS/ACRE' INGS/ACRES INGS	W-LENGTH (FEE' PREAM (FEET)  OO) / (ELEVAT  D MINIMUM TINTENSITY (II  RATE DATA (AI  SCS SOII  GROUP  A  A  VIOUS LOSS R  VIOUS AREA F  = 17.10  9.66  D RAINFALL  54; 1HR = 0.	T) = 95 = 1385.  ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  5.69 3.97 ATE, Fp(I RACTION,  PEAK FLO DEPTH(INC 85; 3HR = ***********************************	2.49 00 DOWN  E)]**0.2 17.1( 2.652  Fp (INCH/ 0. NCH/HR) Ap = 0. W RATE(CH)  ******** 10902 U SUBARE	20 08	Ap ECIMAL) 0.600 0.850 17.10 90; 24HF *******	SCS CN 32 32 )	Tc (MIN.) 17.11 20.06

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.57
 STREET FLOW TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 18.58
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.524
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                               αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.92
                                         0.98 0.600 32
 PUBLIC PARK
             A
                              4.93 0.98 0.850 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.725
 SUBAREA AREA (ACRES) = 9.85 SUBAREA RUNOFF (CFS) = 16.11
 EFFECTIVE AREA(ACRES) = 19.51 AREA-AVERAGED Fm(INCH/HR) = 0.70
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.71
 TOTAL AREA(ACRES) = 19.5 PEAK FLOW RATE(CFS) =
                                                         32.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.62 HALFSTREET FLOOD WIDTH (FEET) = 23.28
 FLOW VELOCITY (FEET/SEC.) = 2.86 DEPTH*VELOCITY (FT*FT/SEC.) = 1.79
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10902.00 = 1191.11 FEET.
********************
 FLOW PROCESS FROM NODE 10902.00 TO NODE 10903.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1376.00 DOWNSTREAM ELEVATION (FEET) = 1372.00
 STREET LENGTH (FEET) = 237.43 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   39.89
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.36
 STREET FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 19.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.445
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.02
                                        0.98 0.600
                               4.30
                                      0.98 0.850 32
 PUBLIC PARK
                      A
 SCHOOL
                       Α
                                0.56
                                        0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.709
 SUBAREA AREA (ACRES) = 9.88 SUBAREA RUNOFF (CFS) = 15.60
 EFFECTIVE AREA(ACRES) = 29.39 AREA-AVERAGED Fm(INCH/HR) = 0.69
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.71
 TOTAL AREA (ACRES) = 29.4 PEAK FLOW RATE (CFS) = 46.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.39
 FLOW VELOCITY (FEET/SEC.) = 4.09 DEPTH*VELOCITY (FT*FT/SEC.) = 2.56
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10903.00 = 1428.54 FEET.
******************
 FLOW PROCESS FROM NODE 10903.00 TO NODE 10904.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1372.00 DOWNSTREAM ELEVATION(FEET) = 1369.00
 STREET LENGTH (FEET) = 248.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   54.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.03
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.59
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 20.68
```

Page 4

Date: 04/21/2014 File name: LR0109ZZ.RES Page 3 Date: 04/21/2014 File name: LR0109ZZ.RES

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.366
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.65
                                     0.98 0.600 32
                             5.21
                                     0.98 0.600 32
 SCHOOL
                      A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.86 SUBAREA RUNOFF(CFS) = 15.81
 EFFECTIVE AREA(ACRES) = 39.25 AREA-AVERAGED Fm(INCH/HR) = 0.67
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 39.2
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46: 30M = 0.95: 1HR = 1.25: 3HR = 2.03: 6HR = 2.75: 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.89
 FLOW VELOCITY (FEET/SEC.) = 3.91 DEPTH*VELOCITY (FT*FT/SEC.) = 2.76
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10904.00 = 1677.04 FEET.
FLOW PROCESS FROM NODE 10904.00 TO NODE 10905.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1369.00 DOWNSTREAM ELEVATION(FEET) = 1366.00
 STREET LENGTH (FEET) = 298.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  69.04
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.03
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.90
 STREET FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 21.97
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.282
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                              5.98
                                        0.98
                                              0.600
                     A
                      A
                               5.81
                                        0.98
                                                0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

```
SUBAREA AREA(ACRES) = 11.79
                               SUBAREA RUNOFF (CFS) = 18.01
 EFFECTIVE AREA(ACRES) = 51.04 AREA-AVERAGED Fm(INCH/HR) = 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 51.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.88
 FLOW VELOCITY (FEET/SEC.) = 3.98 DEPTH*VELOCITY (FT*FT/SEC.) = 3.04
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10905.00 = 1975.54 FEET.
*****************
 FLOW PROCESS FROM NODE 10905.00 TO NODE 10906.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
UPSTREAM ELEVATION (FEET) = 1366.00 DOWNSTREAM ELEVATION (FEET) = 1362.00
 STREET LENGTH (FEET) = 305.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   84.49
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.76
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.52
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.44
 STREET FLOW TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 23.09
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.215
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                 Aр
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A
                            6.54
                                      0.98 0.600
                                                        32
 SCHOOL
                        Α
                                6.29
                                         0.98
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 12.83 SUBAREA RUNOFF(CFS) = 18.82
 EFFECTIVE AREA (ACRES) = 63.87 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) = 63.9 PEAK FLOW RATE (CFS) =
                                                       90.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

File name: LR0109ZZ.RES

Page 6

Date: 04/21/2014

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600

Date: 04/21/2014 File name: LR0109ZZ.RES Page 5

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.49
 FLOW VELOCITY (FEET/SEC.) = 4.63 DEPTH*VELOCITY (FT*FT/SEC.) = 3.59
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10906.00 = 2281.04 FEET.
*************************
 FLOW PROCESS FROM NODE 10906.00 TO NODE 10907.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1362.00 DOWNSTREAM ELEVATION(FEET) = 1355.00
 STREET LENGTH (FEET) = 419.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.58
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 31.49
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.06
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 24.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 14.56
                                      0.98 0.600 32
                      A
                              2.26
                                      0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 16.82 SUBAREA RUNOFF (CFS) = 23.56
 EFFECTIVE AREA(ACRES) = 80.69 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) = 80.7 PEAK FLOW RATE (CFS) = 110.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.28
 FLOW VELOCITY (FEET/SEC.) = 5.34 DEPTH*VELOCITY (FT*FT/SEC.) = 4.23
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10907.00 = 2700.54 FEET.
*******************
 FLOW PROCESS FROM NODE 10907.00 TO NODE 10908.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1355.00 DOWNSTREAM ELEVATION(FEET) = 1347.00
 STREET LENGTH (FEET) = 391.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.92
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.79
  HALFSTREET FLOOD WIDTH (FEET) = 32.16
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.92
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.68
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 25.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.086
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 15.01 0.98 0.600 32
                             0.76
                                    0.98 0.100 32
 COMMERCIAL
                     A
 MOBILE HOME PARK
                     A
                             0.25 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.571
 SUBAREA AREA (ACRES) = 16.02 SUBAREA RUNOFF (CFS) = 22.04
 EFFECTIVE AREA(ACRES) = 96.71 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 96.7 PEAK FLOW RATE(CFS) = 128.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.77
 FLOW VELOCITY (FEET/SEC.) = 6.03 DEPTH*VELOCITY (FT*FT/SEC.) = 4.83
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10908.00 = 3091.54 FEET.
******************
 FLOW PROCESS FROM NODE 10908.00 TO NODE 10909.00 IS CODE = 63
______
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1347.00 DOWNSTREAM ELEVATION(FEET) = 1342.00
 STREET LENGTH (FEET) = 248.60 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
```

Date: 04/21/2014 File name: LR0109ZZ.RES

Page 8

Date: 04/21/2014 File name: LR0109ZZ.RES Page 7

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 135.71
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.82
   HALFSTREET FLOOD WIDTH (FEET) = 33.57
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.08
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.98
 STREET FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 26.21
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.053
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.32
                                       0.98 0.600 32
                                3.33
                                         0.98
                                                  0.100 32
 COMMERCIAL
                       A
 MOBILE HOME PARK A 1.41
                                         0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.385
 SUBAREA AREA(ACRES) = 10.06 SUBAREA RUNOFF(CFS) = 15.18
 EFFECTIVE AREA(ACRES) = 106.77 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 106.8 PEAK FLOW RATE (CFS) = 140.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 33.93
 FLOW VELOCITY (FEET/SEC.) = 6.16 DEPTH*VELOCITY (FT*FT/SEC.) = 5.08
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10909.00 = 3340.14 FEET.
*******************
 FLOW PROCESS FROM NODE 10909.00 TO NODE 10910.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1342.00 DOWNSTREAM ELEVATION(FEET) = 1337.00
 STREET LENGTH (FEET) = 1292.38 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0109ZZ.RES

Page 9

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.10
 HALFSTREET FLOOD WIDTH (FEET) = 47.79
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.46
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.82
STREET FLOW TRAVEL TIME (MIN.) = 6.22 Tc (MIN.) = 32.43
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.807
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A
                               30.86 0.98 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA (ACRES) = 30.86 SUBAREA RUNOFF (CFS) = 33.93
EFFECTIVE AREA(ACRES) = 137.63 AREA-AVERAGED Fm(INCH/HR) = 0.59
AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
TOTAL AREA (ACRES) = 137.6 PEAK FLOW RATE (CFS) = 150.73
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.09 HALFSTREET FLOOD WIDTH(FEET) = 46.99
FLOW VELOCITY (FEET/SEC.) = 3.43 DEPTH*VELOCITY (FT*FT/SEC.) = 3.73
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 4.13
PIPE-FLOW(CFS) =
                   12.97
PIPEFLOW TRAVEL TIME (MIN.) = 5.22 Tc (MIN.) = 31.43
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.841
SUBAREA AREA (ACRES) = 30.86 SUBAREA RUNOFF (CFS) = 34.88
TOTAL AREA (ACRES) = 137.6 PEAK FLOW RATE (CFS) = 154.97
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 141.99
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.07
 HALFSTREET FLOOD WIDTH (FEET) = 45.96
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.38
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.60
LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10910.00 = 4632.52 FEET.
```

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

Date: 04/21/2014 File name: LR0109ZZ.RES Page 10

EFFECTIVE AREA(ACRES) = 209.78 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60 TOTAL AREA(ACRES) = 209.8 PEAK FLOW RATE (CFS) = 204.38

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 1.14 HALFSTREET FLOOD WIDTH(FEET) = 49.80 FLOW VELOCITY (FEET/SEC.) = 4.14 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.73

File name: LR0109ZZ.RES

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 6.62 PIPE-FLOW(CFS) = 54.98 PIPEFLOW TRAVEL TIME (MIN.) = 3.38 Tc (MIN.) = 34.81 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.731

Date: 04/21/2014

```
SUBAREA AREA (ACRES) = 72.15 SUBAREA RUNOFF (CFS) = 74.35
                   209.8
 TOTAL AREA (ACRES) =
                              PEAK FLOW RATE (CFS) = 215.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 160.79
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.06
   HALFSTREET FLOOD WIDTH (FEET) = 45.53
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.12
 LONGEST FLOWPATH FROM NODE 10900.00 TO NODE 10911.00 = 5974.52 FEET.
______
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 209.8 TC(MIN.) =
 EFFECTIVE AREA (ACRES) = 209.78 AREA-AVERAGED Fm (INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.604
 PEAK FLOW RATE(CFS) =
                        215.77
______
```

END OF RATIONAL METHOD ANALYSIS

Page 11 Date: 04/21/2014 File name: LR0109ZZ.RES Page 12 Date: 04/21/2014 File name: LR0109ZZ.RES Page 13 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11015 (FILE LR0110ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

FILE NAME: LR0110ZZ.DAT

TIME/DATE OF STUDY: 14:35 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR F

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) \_\_\_\_\_ 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

19 52 0	15.0	0.020/0.020 0.020/0.020 0.020/0.020	0/0.020	0.67	2.00	0.0312 0	.167	0.0180
GLOBAL ST  1. Rela as ( 2. (Dep *SIZE PIP	REET FLOW-I tive Flow-I Maximum Ali th)*(Veloc: E WITH A FI	DEPTH CONSTRA Depth = 0.20 lowable Stree ity) Constrai LOW CAPACITY STREAM TRIBUT	AINTS: ) FEET et Flow I Int = 6. GREATER	epth) - 0 (FT*F'	(Top-			
~		IMUM TOPOGRAF			TMENT I	NOT SELEC	TED	
WATERSH USED "V 1 UNITS FOR DEV PRECIPI SIERRA	ED LAG = 0. ALLEY UNDEV ACRE AND 1 ELOPMENTS ( TATION DATA MADRE DEPTI	EL SELECTIONS .80 * Tc VELOPED" S-GF LESS; AND "VF DF 2 UNITS/AC A ENTERED ON H-AREA FACTOF CONDITION (F	RAPH FOR ALLEY DEV CRE AND M SUBAREA RS USED.	DEVELOPI ELOPED" IORE. BASIS.	S-GRA	PH	RAPH	METHOD
		************* ODE 11000.00						*****
>>>>>RATT		D TMTTTAT CITE		\T.YSTS<<	<<<			
>>USE TIM	UBAREA FLO	NTRATION NOMO ===================================	OGRAPH FO ======== [) = 60	R INITIA ======== 04.68	AL SUB	======		
>>USE TIM INITIAL S ELEVATION  TC = K*[( SUBAREA A * 100 YEA SUBAREA T DEVELOPM	E-OF-CONCEN  BENEAR FLOW DATA: UPST  LENGTH** 3  NALYSIS USI R RAINFALL C AND LOSS ENT TYPE/	NTRATION NOMC	OGRAPH FC ====================================	OR INITIA 14.68 00 DOWN GE)]**0 = 9.81 = 3.687	AL SUBA =====: NSTREAN 20 91	======================================	s 13	85.00 Tc
>>USE TIM  INITIAL S ELEVATION  TC = K*[( SUBAREA A * 100 YEA SUBAREA T DEVELOPM LAND RESIDENTI	E-OF-CONCEN	NTRATION NOM	OGRAPH FC 	OR INITIA 14.68 00 DOWN (EE)]**0.: 9.89 3.687 Fp (INCH,	AL SUBA	Ap	SCS CN	85.00 Tc (MIN.
>>USE TIM  INITIAL S ELEVATION  TC = K*[( SUBAREA A * 100 YEA SUBAREA T DEVELOPM LANDI RESIDENTI "3-4 DWEL PUBLIC PA MOBILE HO SUBAREA A SUBAREA A	E-OF-CONCEN ===================================	NTRATION NOMC	OGRAPH FC	PR INITIZ  14.68  00 DOWN  EE)]**0.2  9.88  3.687  Fp  (INCH,  0 0  0 0  ENCH/HR)  Ap = 0	AL SUBA NSTREAL 20 91 /HR) .98 .98 .98 .98	Ap (DECIMAL)  0.600 0.850 0.250	scs cn 32 32 32	TC (MIN. 12.1 14.2
>>USE TIM ====================================	E-OF-CONCEN ===================================	NTRATION NOMC	OGRAPH FC	PR INITIZ  14.68  00 DOWN  EE)]**0.2  9.88  3.687  Fp  (INCH,  0 0  0 0  ENCH/HR)  Ap = 0	AL SUBA NSTREAL 20 91 /HR) .98 .98 .98 .98	Ap (DECIMAL)  0.600 0.850 0.250	scs cn 32 32 32	TC (MIN. 12.1 14.2
>>USE TIM INITIAL S ELEVATION  TC = K*[( SUBAREA A * 100 YEA SUBAREA T DEVELOPM LAND RESIDENTI "3-4 DWEL PUBLIC PA MOBILE HO SUBAREA A SUBAREA A SUBAREA A SUBAREA A SUBAREA A SUBAREA A	E-OF-CONCENT ====================================	NTRATION NOMC	OGRAPH FC C) = 60 = 1395.  ION CHANG C(MIN.) = NCH/HR) = NC II): AREA (ACRES)  1.70 2.08 ATE, FP(I RACTION, PEAK FLO DEPTH(INC	PR INITIZE 14.68 00 DOWN SE) ] **0.2	AL SUBA NSTREAD  OP  OP  OP  OP  OP  OP  OP  OP  OP  O	Ap (DECIMAL)  0.600 0.850 0.250 97	SCS CN 32 32 32	TC (MIN. 12.1 14.2 9.8
>>USE TIM ====================================	E-OF-CONCENT ====================================	NTRATION NOMC	OGRAPH FC	PR INITIZE 14.68 00 DOWN SE) 1**0.2 9.8 9.8 9.8 9.8 10.6 10.6 10.6 10.6 10.6 10.6 10.6 10.6	AL SUBA NSTREAD 20 91  /HR)  .98 .98 .98 .528  CFS) =	Ap (DECIMAL)  0.600 0.850 0.250 97  18.9	SCS CN 32 32 32 32 32	TC (MIN. 12.1 14.2 9.8
>>USE TIM ======== INITIAL S ELEVATION  TC = K*[( SUBAREA A * 100 YEA SUBAREA T DEVELOPM RESIDENTI "3-4 DWEL PUBLIC PA MOBILE HO SUBAREA A SUBAREA A SUBAREA A SUBAREA A SUBAREA A 5M = 0.46  ********* FLOW PROC >>>>COMP >>>> (STR	E-OF-CONCENT ====================================	NTRATION NOMC	OGRAPH FC	PR INITIZE 14.68 00 DOWN 15.5 3.687 Fp (INCH, HR) Ap = 0 DW RATE (CH): 2.03; CH   2.03;	AL SUB:	Ap (DECIMAL) 0.600 0.850 0.250 97 18.9 2.75; 24H	SCS CN 32 32 32 32	Tc (MIN. 12.1 14.2 9.8

File name: LR0110ZZ.RES

Page 2

Date: 04/21/2014

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.79
                                                                                    ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.52
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 18.81
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.20
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.17
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 11.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.339
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
   STREET FLOW DEPTH(FEET) = 0.49
                                                                                                                                         SCS
   HALFSTREET FLOOD WIDTH (FEET) = 17.96
                                                                                      LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  PUBLIC PARK
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.48
                                                                                                     A 1.71 0.98 0.850
                                                                                                       A 0.19 0.98 0.600
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
                                                                                  SCHOOL
                                                                                                                                         32
 STREET FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 10.71
                                                                                  RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.515
                                                                                  "3-4 DWELLINGS/ACRE" A 0.72 0.98 0.600
                                                                                                                                         32
                                                                                                      A 2.21 0.98 0.250 32
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  MOBILE HOME PARK
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ap SCS
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.528
 PUBLIC PARK
                      A 1.41 0.98 0.850 32
                                                                                  SUBAREA AREA(ACRES) = 4.83 SUBAREA RUNOFF(CFS) = 12.27
                                                                                  EFFECTIVE AREA(ACRES) = 15.06 AREA-AVERAGED Fm(INCH/HR) = 0.59
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.24 0.98 0.600 32
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
               A 1.96
                                      0.98 0.850 32
                                                                                  TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) = 37.31
 PUBLIC PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.833
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 3.61 SUBAREA RUNOFF(CFS) = 8.78
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 EFFECTIVE AREA(ACRES) = 10.23 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.64
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 10.2 PEAK FLOW RATE (CFS) =
                                                                                  DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.66
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.41 DEPTH*VELOCITY (FT*FT/SEC.) = 2.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11003.00 = 1017.18 FEET.
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  FLOW PROCESS FROM NODE 11003.00 TO NODE 11004.00 IS CODE = 63
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 FLOW VELOCITY (FEET/SEC.) = 3.69 DEPTH*VELOCITY (FT*FT/SEC.) = 1.85
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11002.00 = 775.68 FEET.
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                ______
******************
                                                                                  UPSTREAM ELEVATION(FEET) = 1377.00 DOWNSTREAM ELEVATION(FEET) = 1374.00
                                                                                  STREET LENGTH (FEET) = 241.50 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 11002.00 TO NODE 11003.00 IS CODE = 63
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
_____
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1382.00 DOWNSTREAM ELEVATION(FEET) = 1377.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 241.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     43.25
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014 File name: LR0110ZZ.RES Page 3

Date: 04/21/2014

File name: LR0110ZZ.RES

```
STREET FLOW DEPTH (FEET) = 0.60
  HALFSTREET FLOOD WIDTH (FEET) = 22.77
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.89
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.32
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 12.70
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.173
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Ap
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SCHOOL
                       A
                               2.11 0.98 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 2.99 0.98
                                                  0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 5.10
                               SUBAREA RUNOFF(CFS) = 11.88
 EFFECTIVE AREA(ACRES) = 20.16 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 20.2 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.51
 FLOW VELOCITY (FEET/SEC.) = 3.98 DEPTH*VELOCITY (FT*FT/SEC.) = 2.43
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11004.00 = 1258.68 FEET.
******************
 FLOW PROCESS FROM NODE 11004.00 TO NODE 11005.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1374.00 DOWNSTREAM ELEVATION(FEET) = 1369.00
 STREET LENGTH (FEET) = 284.59 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     53.61
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
  HALFSTREET FLOOD WIDTH (FEET) = 23.14
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.69
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.82
 STREET FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 13.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.030
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
```

```
LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                            2.36
                                         0.98
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 3.70 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.06 SUBAREA RUNOFF(CFS) = 13.34
 EFFECTIVE AREA(ACRES) = 26.22 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 26.2 PEAK FLOW RATE (CFS) =
                                                         57.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.81
 FLOW VELOCITY (FEET/SEC.) = 4.78 DEPTH*VELOCITY (FT*FT/SEC.) = 2.94
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11005.00 = 1543.27 FEET.
******************
 FLOW PROCESS FROM NODE 11005.00 TO NODE 11006.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1369.00 DOWNSTREAM ELEVATION(FEET) = 1363.00
 STREET LENGTH (FEET) = 305.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   64.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.21
 STREET FLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 14.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.906
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                     Fρ
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                      A 2.52
                                        0.98
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                              3.72 0.98 0.600
                                                        32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.24 SUBAREA RUNOFF(CFS) = 13.04
 EFFECTIVE AREA(ACRES) = 32.46 AREA-AVERAGED Fm(INCH/HR) = 0.59
```

Page 6

```
AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                    32.5
                                                         67.80
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.79
 FLOW VELOCITY (FEET/SEC.) = 5.21 DEPTH*VELOCITY (FT*FT/SEC.) = 3.31
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11006.00 = 1848.77 FEET.
******************
 FLOW PROCESS FROM NODE 11006.00 TO NODE 11007.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1363.00 DOWNSTREAM ELEVATION (FEET) = 1355.00
 STREET LENGTH (FEET) = 426.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.56
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 16.04
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.759
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SCHOOL
                      A 5.15 0.98 0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.83 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                              SUBAREA RUNOFF(CFS) = 19.52
 SUBAREA AREA(ACRES) = 9.98
 EFFECTIVE AREA(ACRES) = 42.44 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 42.4 PEAK FLOW RATE (CFS) =
                                                       83.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.98
```

```
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11007.00 = 2275.27 FEET.
FLOW PROCESS FROM NODE 11007.00 TO NODE 11008.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1355.00 DOWNSTREAM ELEVATION(FEET) = 1350.00
 STREET LENGTH (FEET) = 383.57 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    91 64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 30.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.61
 STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 17.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.631
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.55 0.98 0.600
                                                         32
 MOBILE HOME PARK
                      A
                              0.33
                                       0.98 0.250 32
                                         0.98 0.600 32
                              5.45
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.588
 SUBAREA AREA(ACRES) = 9.33 SUBAREA RUNOFF(CFS) = 17.28
 EFFECTIVE AREA(ACRES) = 51.77 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 51.8 PEAK FLOW RATE (CFS) =
                                                          95.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.59
 FLOW VELOCITY (FEET/SEC.) = 4.91 DEPTH*VELOCITY (FT*FT/SEC.) = 3.69
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 383.6 FT WITH ELEVATION-DROP = 5.0 FT, IS 28.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11008.00
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11008.00 = 2658.84 FEET.
```

FLOW VELOCITY (FEET/SEC.) = 5.43 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.69

Date: 04/21/2014 File name: LR0110ZZ.RES Page 7 Date: 04/21/2014 File name: LR0110ZZ.RES Page 8

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1350.00 DOWNSTREAM ELEVATION(FEET) = 1345.00
 STREET LENGTH (FEET) = 249.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                              100.74
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 28.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.17
 STREET FLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 18.07
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.568
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                             Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK A 1.94 0.98
                                             0.250 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.37 0.98
                                            0.600 32
                             3.32
                                    0.98
                                              0.600 32
                     A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.479
 SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 10.65
 EFFECTIVE AREA(ACRES) = 57.40 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 57.4 PEAK FLOW RATE (CFS) = 103.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.00
 FLOW VELOCITY (FEET/SEC.) = 5.88 DEPTH*VELOCITY (FT*FT/SEC.) = 4.23
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11009.00 = 2907.94 FEET.
******************
 FLOW PROCESS FROM NODE 11009.00 TO NODE 11010.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1345.00 DOWNSTREAM ELEVATION(FEET) = 1336.00
 STREET LENGTH (FEET) = 660.50 CURB HEIGHT (INCHES) = 6.0
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   121.18
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 33.33
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.26
 STREET FLOW TRAVEL TIME (MIN.) = 2.09 Tc (MIN.) = 20.15
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.406
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 12.60 0.98 0.600
                       A 7.72 0.98 0.250
 MOBILE HOME PARK
 SCHOOL
                       A
                               0.25 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.469
 SUBAREA AREA (ACRES) = 20.57 SUBAREA RUNOFF (CFS) = 36.08
 EFFECTIVE AREA (ACRES) = 77.97 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 78.0 PEAK FLOW RATE (CFS) = 130.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 34.31
 FLOW VELOCITY (FEET/SEC.) = 5.39 DEPTH*VELOCITY (FT*FT/SEC.) = 4.45
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 660.5 FT WITH ELEVATION-DROP = 9.0 FT, IS 56.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11010.00
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11010.00 = 3568.44 FEET.
******************
 FLOW PROCESS FROM NODE 11010.00 TO NODE 11011.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1336.00 DOWNSTREAM ELEVATION(FEET) = 1323.00
 STREET LENGTH (FEET) = 1187.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
       Date: 04/21/2014
                       File name: LR0110ZZ.RES
                                                        Page 10
```

STREET HALFWIDTH (FEET) = 18.00

Date: 04/21/2014 File name: LR0110ZZ.RES Page 9

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 156.99

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 156.

\*\*\*STREET FLOWING FULL\*\*\*

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.91

HALFSTREET FLOOD WIDTH(FEET) = 38.52

AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.16

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.70

STREET FLOW TRAVEL TIME(MIN.) = 3.83 Tc(MIN.) = 23.98

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.167

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A 36.02 0.98 0.600 32
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.69 0.75 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA(ACRES) = 36.71 SUBAREA RUNOFF(CFS) = 52.35

SCS

EFFECTIVE AREA (ACRES) = 114.68 AREA-AVERAGED Fm (INCH/HR) = 0.55
AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.57

TOTAL AREA (ACRES) = 114.7 PEAK FLOW RATE (CFS) = 166.4

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN

THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90

SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:

\*\* PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE \*\*

ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES =

ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE

PIPE-FLOW VELOCITY(FEET/SEC.) = 18.08

PIPE-FLOW(CFS) = 56.86

PIPEFLOW TRAVEL TIME(MIN.) = 1.09 Tc(MIN.) = 21.25

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.330

SUBAREA AREA(ACRES) = 36.71 SUBAREA RUNOFF(CFS) = 57.75

TOTAL AREA (ACRES) = 114.7 PEAK FLOW RATE (CFS) = 183.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :

STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 126.42

\*\*\*STREET FLOWING FULL\*\*\*

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 0.85

HALFSTREET FLOOD WIDTH (FEET) = 35.35 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.16LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11011.00 = 4755.44 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11011.00 TO NODE 11012.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1323.00 DOWNSTREAM ELEVATION(FEET) = 1305.00 STREET LENGTH (FEET) = 860.03 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 202.83 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.89HALFSTREET FLOOD WIDTH (FEET) = 37.54 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.01PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 6.25 STREET FLOW TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 23.29 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.205 SUBAREA LOSS RATE DATA (AMC II):

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

RESIDENTIAL
"3-4 DWELLINGS/ACRE" A 14.11 0.98 0.600 32
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 11.70 0.75 0.600 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87 SUBAREA AVERAGE PERVIOUS AREA FRACTION. Ap = 0.600

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600

SUBAREA AREA(ACRES) = 25.81 SUBAREA RUNOFF(CFS) = 39.08 EFFECTIVE AREA(ACRES) = 140.49 AREA-AVERAGED Fm(INCH/HR) = 0.55

AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.58 TOTAL AREA(ACRES) = 140.5 PEAK FLOW RATE(CFS) =

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

209.46

 ${\tt END}$  OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 37.97 FLOW VELOCITY(FEET/SEC.) = 7.08 DEPTH\*VELOCITY(FT\*FT/SEC.) = 6.37

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:

Date: 04/21/2014 File name: LR0110ZZ.RES Page 11 Date: 04/21/2014 File name: LR0110ZZ.RES Page 12

```
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 25.00
 PIPE-FLOW(CFS) = 78.60
 PIPEFLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 21.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.294
 SUBAREA AREA(ACRES) = 25.81 SUBAREA RUNOFF(CFS) = 41.12
 TOTAL AREA (ACRES) = 140.5 PEAK FLOW RATE (CFS) = 220.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 141.99
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.11
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11012.00 = 5615.47 FEET.
FLOW PROCESS FROM NODE 11012.00 TO NODE 11013.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1305.00 DOWNSTREAM ELEVATION(FEET) = 1295.00
 STREET LENGTH (FEET) = 1312.53 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.15
   HALFSTREET FLOOD WIDTH (FEET) = 49.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.74
 STREET FLOW TRAVEL TIME (MIN.) = 4.37 Tc (MIN.) = 26.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.056
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 35.19
                                        0.98
                                                0.600 32
 MOBILE HOME PARK
                    A
                               5.79
                                          0.98
                                                  0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.551
 SUBAREA AREA(ACRES) = 40.98
                                SUBAREA RUNOFF (CFS) = 56.02
 EFFECTIVE AREA(ACRES) = 181.47 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 181.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.14 HALFSTREET FLOOD WIDTH(FEET) = 49.80
 FLOW VELOCITY (FEET/SEC.) = 4.99 DEPTH*VELOCITY (FT*FT/SEC.) = 5.71
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.50
 PIPE-FLOW(CFS) =
                     86.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 23.07
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.218
 SUBAREA AREA (ACRES) = 40.98 SUBAREA RUNOFF (CFS) = 62.01
 TOTAL AREA (ACRES) = 181.5 PEAK FLOW RATE (CFS) = 273.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 187.08
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.04
   HALFSTREET FLOOD WIDTH (FEET) = 44.86
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.67
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.88
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11013.00 = 6928.00 FEET.
******************
 FLOW PROCESS FROM NODE 11013.00 TO NODE 11014.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1295.00 DOWNSTREAM ELEVATION (FEET) = 1292.00
 STREET LENGTH (FEET) = 1328.18 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
```

File name: LR0110ZZ.RES

Page 14

Date: 04/21/2014

Date: 04/21/2014 File name: LR0110ZZ.RES Page 13

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 318.93
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 1.53
 HALFSTREET FLOOD WIDTH (FEET) = 69.33
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.33
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.10
STREET FLOW TRAVEL TIME (MIN.) = 6.66 Tc (MIN.) = 29.73
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.905
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    Ap
                                                          SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 4.68
                                          0.75
                                                   0.600
                                                          56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"
                       A 57.49
                                          0.98
                                                   0.600
                                                           32
AGRICULTURAL FAIR COVER
"ORCHARDS"
                                18.33
                                          0.88
                                                 1.000
                        A
AGRICULTURAL FAIR COVER
"ORCHARDS"
                         В
                               0.15 0.63 1.000
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
SUBAREA AREA(ACRES) = 80.65 SUBAREA RUNOFF(CFS) = 91.52
EFFECTIVE AREA(ACRES) = 262.12 AREA-AVERAGED Fm(INCH/HR) = 0.58
AREA-AVERAGED Fp (INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.61
TOTAL AREA(ACRES) = 262.1 PEAK FLOW RATE(CFS) = 313.47
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.52 HALFSTREET FLOOD WIDTH(FEET) = 68.90
FLOW VELOCITY (FEET/SEC.) = 3.31 DEPTH*VELOCITY (FT*FT/SEC.) = 5.05
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 14.62
PIPE-FLOW(CFS) = 259.36
PIPEFLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 24.58
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.135
SUBAREA AREA (ACRES) = 80.65 SUBAREA RUNOFF (CFS) = 108.22
TOTAL AREA (ACRES) = 262.1 PEAK FLOW RATE (CFS) = 367.74
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 108.38
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.07
 HALFSTREET FLOOD WIDTH (FEET) = 45.96
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.58
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.75
LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11014.00 = 8256.18 FEET.
```

```
FLOW PROCESS FROM NODE 11014.00 TO NODE 11015.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
UPSTREAM ELEVATION (FEET) = 1292.00 DOWNSTREAM ELEVATION (FEET) = 1260.00
STREET LENGTH (FEET) = 2883.01 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 26.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.30
 HALFSTREET FLOOD WIDTH (FEET) = 57.80
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.61
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.61
STREET FLOW TRAVEL TIME (MIN.) = 7.27 Tc (MIN.) = 31.85
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.828
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                       Fρ
    LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"
                     B 68.14
                                           0.75
                                                   0.600
                                                            56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A 51.31
                                           0.98
                                                   0.600
                                                            32
NATURAL FAIR COVER
"OPEN BRUSH"
                               3.04
                                           0.86 1.000
                                                            46
                         A
                                 0.17
                                           0.98 0.850
PUBLIC PARK
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.610
SUBAREA AREA (ACRES) = 122.66 SUBAREA RUNOFF (CFS) = 144.76
EFFECTIVE AREA(ACRES) = 384.78 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.61
TOTAL AREA (ACRES) = 384.8 PEAK FLOW RATE (CFS) = 440.00
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.30 HALFSTREET FLOOD WIDTH(FEET) = 57.80
FLOW VELOCITY (FEET/SEC.) = 6.61 DEPTH*VELOCITY (FT*FT/SEC.) = 8.61
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
```

File name: LR0110ZZ.RES

Page 16

Date: 04/21/2014

\*

Date: 04/21/2014 File name: LR0110ZZ.RES Page 15

```
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.69
 PIPE-FLOW(CFS) = 306.07
 PIPEFLOW TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 26.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.050
 SUBAREA AREA(ACRES) = 122.66 SUBAREA RUNOFF(CFS) = 169.24
 TOTAL AREA(ACRES) = 384.8
                             PEAK FLOW RATE (CFS) = 516.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 210.71
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 1.02
  HALFSTREET FLOOD WIDTH (FEET) = 43.76
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.53
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.65
 LONGEST FLOWPATH FROM NODE 11000.00 TO NODE 11015.00 = 11139.19 FEET.
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 384.8 TC (MIN.) = 26.32
 EFFECTIVE AREA(ACRES) = 384.78 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.608
 PEAK FLOW RATE(CFS) = 516.77
______
______
```

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0110ZZ.RES Page 17 Date: 04/21/2014 File name: LR0110ZZ.RES Page 18

\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

### Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11158 (FILE LR0111ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

FILE NAME: LR0111ZZ.DAT

TIME/DATE OF STUDY: 14:36 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.67 2.00 0.0312 0.167 0.0180 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 18 26.0 19 52.0	10.0 15.0 20.0	0.020/0.020/ 0.020/0.020/ 0.020/0.020/	0.020	0.50 0.67 0.67	2.00	0.0312 ( 0.0312 ( 0.0312 (	1.125 1.167 1.167	0.0180 0.0180 0.0180
1. Relativ as (Max 2. (Depth) *SIZE PIPE W OR EQUAL TO	re Flow-D imum All *(Veloci IITH A FL THE UPS	DEPTH CONSTRAI Depth = 0.20 Depth = 0.20 Dep	FEET Flow Dent = 6.0 GREATER TARY PIPE.	) (FT*FT THAN .*	/S)		CTED	
WATERSHED USED "VALL 1 UNITS/AC FOR DEVELO PRECIPITAT SIERRA MAD	LAG = 0. EY UNDEV RE AND L PMENTS O TION DATA RE DEPTH	EL SELECTIONS/ 80 * Tc ELOPED" S-GRA LESS; AND "VAI OF 2 UNITS/ACF A ENTERED ON S I-AREA FACTORS CONDITION (AM	APH FOR I LEY DEVE RE AND MO SUBAREA E USED.	DEVELOPM ELOPED" DRE. BASIS.	S-GRA	PH	GRAPH	METHOD
*************** FLOW PROCESS		**************************************						*****
		) INITIAL SUBA	REA ANAI	YSIS<<	 <<			
VIICE DIME O								
>>USE TIME-U		TRATION NOMOG						
INITIAL SUBA	REA FLOW	 I-LENGTH (FEET)	= 876	 5.30	====:	======		
INITIAL SUBA	REA FLOW		= 876 1350.0	5.30 00 DOWN	===== STREAI	======		
INITIAL SUBA ELEVATION DA Tc = K*[(LEN SUBAREA ANAL	REA FLOW TA: UPST GTH** 3.	J-LENGTH (FEET) REAM (FEET) =  00) / (ELEVATION D MINIMUM TO (	= 876 1350.0 ON CHANGE	5.30 00 DOWN E)]**0.2	====: STREAI 0	======		
INITIAL SUBA ELEVATION DA TC = K*[(LEN SUBAREA ANAL * 100 YEAR R	REA FLOW TA: UPST GTH** 3. YSIS USE	J-LENGTH (FEET) REAM (FEET) = 00) / (ELEVATIC D MINIMUM TC ( INTENSITY (INC	= 876 1350.0 0N CHANGE (MIN.) = CH/HR) =	5.30 00 DOWN E)]**0.2	====: STREAI 0	======		
INITIAL SUBA ELEVATION DA TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US	REA FLOW TA: UPST GTH** 3. YSIS USE AINFALL ND LOSS TYPE/	J-LENGTH (FEET) REAM (FEET) =  00) / (ELEVATION D MINIMUM TO (	= 876 1350.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA	5.30 00 DOWN E)]**0.2 11.41 3.382	STREAI	======================================	= 13	41.00 Tc
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL	REA FLOW TA: UPST GTH** 3. YSIS USE AINFALL ND LOSS TYPE/	J-LENGTH (FEET) REAM (FEET) =  00) / (ELEVATIO D MINIMUM TO ( INTENSITY (INC RATE DATA (AMC SCS SOIL	= 876 1350.0 0N CHANGE (MIN.) = 2H/HR) = 2 II): AREA (ACRES)	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH/	STREAL 0 9 HR)	Ap (DECIMAL)	= 13  SCS CN  32	41.00 Tc (MIN. 15.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN	REA FLOW TA: UPST  GTH** 3. YSIS USE LAINFALL ND LOSS TYPE/ E  GS/ACRE"	J-LENGTH (FEET) CREAM (FEET) =  00) / (ELEVATION D MINIMUM TO ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  A A A	= 876 1350.0 ON CHANGE MIN.) = CH/HR) = CH/HR) = CH/HR	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH/ 0. 0.	====: STREAM 0 9 HR) 98 98	Ap (DECIMAL) 0.600 0.100 0.500	SCS CN 32 32	Tc (MIN. 15.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN SUBAREA AVER SUBAREA AVER	REA FLOW TA: UPST GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E GS/ACRE" GS/ACRE"	J-LENGTH (FEET)  PREAM (FEET) =  00) / (ELEVATION  D MINIMUM TO ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  A A  JOUR LOSS RAT  JOUS LOSS RAT	= 876 1350.0 ON CHANGE MIN.) = CH/HR) = CI): AREA (ACRES) 3.15 4.24 0.96 TE, Fp(IN	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH/ 0. 0. NCH/HR)	STREAM 0 9 HR) 98 98 = 0.5	Ap (DECIMAL) 0.600 0.100 0.500	SCS CN 32 32	Tc (MIN. 15.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN SUBAREA AVER SUBAREA AVER SUBAREA RUNO	REA FLOW TA: UPST  GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E  GS/ACRE"  GS/ACRE"  AGE PERV AGE PERV AGE PERV	J-LENGTH (FEET)  PREAM (FEET) =  00) / (ELEVATION  D MINIMUM TO ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  A A  JOUR LOSS RAT  JOUS LOSS RAT	= 876 1350.0 ON CHANGE MIN.) = CH/HR) = CI): AREA (ACRES) 3.15 4.24 0.96 CE, Fp(IN	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH/ 0. 0. NCH/HR) Ap = 0.	STREAM 0 9 HR) 98 98 = 0.9	Ap (DECIMAL)  0.600 0.100  0.500	scs cn 32 32	Tc (MIN. 15.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN SUBAREA AVER SUBAREA AVER SUBAREA RUNO TOTAL AREA (A	REA FLOW TA: UPST  GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E  GS/ACRE"  AGE PERV	J-LENGTH (FEET)  REAM (FEET) =  00) / (ELEVATION  D MINIMUM TO ( INTENSITY (INC  RATE DATA (AMC  SCS SOIL  GROUP  A  A  ZIOUS LOSS RAT  ZIOUS AREA FRA  = 22.97  8.35 F	= 876 1350.0 ON CHANGE MIN.) = EH/HR) = EII): AREA (ACRES) 3.15 4.24 0.96 EE, Fp(IN	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C	STREAM 0 9 HR) 98 98 = 0.9	Ap (DECIMAL)  0.600 0.100  0.500	scs cn 32 32	Tc (MIN. 15.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN SUBAREA AVER SUBAREA AVER SUBAREA RUNO TOTAL AREA (A	REA FLOW TA: UPST  GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E  GS/ACRE"  GS/ACRE"  AGE PERV AG	J-LENGTH (FEET)  PREAM (FEET) =  00) / (ELEVATION  D MINIMUM TO ( INTENSITY (INC  RATE DATA (AMC  SCS SOIL  GROUP  A  A  VIOUS LOSS RAT  VIOUS AREA FRA  = 22.97	= 876 1350.0 ON CHANGE MIN.) = EH/HR) = EII): AREA (ACRES) 3.15 4.24 0.96 FE, FP(IN CCTION, F	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH// 0. 0. NCH/HR) Ap = 0. V RATE(C	STREAM 0 9 HR) 98 98 = 0.9 335 FS) =	Ap (DECIMAL)  0.600 0.100  0.500 98	scs cn 32 32 32	TC (MIN. 15.4 11.4
INITIAL SUBA ELEVATION DA  TC = K*[(LEN SUBAREA ANAL * 100 YEAR R SUBAREA TC A DEVELOPMENT LAND US RESIDENTIAL "3-4 DWELLIN COMMERCIAL RESIDENTIAL "5-7 DWELLIN SUBAREA AVER SUBAREA AVER SUBAREA AVER SUBAREA RUNO TOTAL AREA (A  SUBAREA AREA 5M = 0.46; 3	REA FLOW TA: UPST GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E GS/ACRE" GS/ACRE" AGE PERV AGE PE	J-LENGTH (FEET)  REAM (FEET) =  00) / (ELEVATION  REAM (FEET) =  00) / (ELEVATION  INTENSITY (INC  RATE DATA (AMC  SCS SOIL  GROUP  A  A  YIOUS LOSS RAT  YIOUS AREA FRA  = 22.97  8.35 F  CD RAINFALL DE  15; 1HR = 1.25	= 876 1350.0 ON CHANGE MIN.) = CH/HR) =	5.30 00 DOWN E)]**0.2 11.41 3.382 Fp (INCH// 0. 0. NCH/HR) Ap = 0. W RATE (C	STREAM 0 9 HR) 98 98 = 0.9 335 FS) = HR = 2	Ap (DECIMAL)  0.600 0.100  0.500 98  22.9	SCS CN 32 32 32 37  IR = 5	TC (MIN. 15.4 11.4 14.6

Date: 04/21/2014

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    57.77
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 25.58
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.88
 STREET FLOW TRAVEL TIME (MIN.) = 5.03 Tc (MIN.) = 19.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.426
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.95 0.98 0.600 COMMERCIAL A 9.58 0.98 0.100
                                                         32
                                                         32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 2.34 0.98 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.319
 SUBAREA AREA(ACRES) = 17.87 SUBAREA RUNOFF(CFS) = 34.02
 EFFECTIVE AREA(ACRES) = 35.44 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 35.4 PEAK FLOW RATE (CFS) =
                                                          67.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.40
 FLOW VELOCITY (FEET/SEC.) = 4.56 DEPTH*VELOCITY (FT*FT/SEC.) = 3.16
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11103.00 = 2878.33 FEET.
******************
 FLOW PROCESS FROM NODE 11103.00 TO NODE 11104.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1310.00 DOWNSTREAM ELEVATION(FEET) = 1302.00
 STREET LENGTH (FEET) = 333.78 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0111ZZ.RES

Page 4

Date: 04/21/2014 File name: LR0111ZZ.RES Page 3

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.306
   STREET FLOW DEPTH (FEET) = 0.68
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 26.79
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.24
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.58
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" A 2.52 0.98 0.600 COMMERCIAL A 1.59 0.98 0.100
 STREET FLOW TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 20.93
                                                                                                                                        32
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.351
                                                                                                                                        32
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 "5-7 DWELLINGS/ACRE" A 0.20 0.98 0.500 32
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.411
 "3-4 DWELLINGS/ACRE"
                     A 5.14
                                                0.600 32
                                                                                 SUBAREA AREA (ACRES) = 4.31 SUBAREA RUNOFF (CFS) = 7.39
                                        0.98
 COMMERCIAL
                      A 2.30
                                        0.98
                                                0.100 32
                                                                                 EFFECTIVE AREA (ACRES) = 47.52 AREA-AVERAGED Fm (INCH/HR) = 0.34
 RESIDENTIAL
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.35
 "5-7 DWELLINGS/ACRE" A 0.33 0.98 0.500 32
                                                                                 TOTAL AREA (ACRES) = 47.5 PEAK FLOW RATE (CFS) =
                                                                                                                                         84.04
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 7.77 SUBAREA RUNOFF (CFS) = 13.39
                                                                                 5M = 0.46: 30M = 0.95: 1HR = 1.25: 3HR = 2.03: 6HR = 2.75: 24HR = 5.50
 EFFECTIVE AREA(ACRES) = 43.21 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.34
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 43.2 PEAK FLOW RATE (CFS) = 78.41
                                                                                 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.43
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.30 DEPTH*VELOCITY (FT*FT/SEC.) = 3.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11105.00 = 3389.26 FEET.
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 FLOW PROCESS FROM NODE 11105.00 TO NODE 11106.00 IS CODE = 63
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.22
                                                                                ______
 FLOW VELOCITY(FEET/SEC.) = 5.37 DEPTH*VELOCITY(FT*FT/SEC.) = 3.71
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11104.00 = 3212.11 FEET.
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                _____
*****************
                                                                                 UPSTREAM ELEVATION(FEET) = 1300.00 DOWNSTREAM ELEVATION(FEET) = 1298.00
 FLOW PROCESS FROM NODE 11104.00 TO NODE 11105.00 IS CODE = 63
                                                                                 STREET LENGTH (FEET) = 169.00 CURB HEIGHT (INCHES) = 8.0
______
                                                                                 STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
_____
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1302.00 DOWNSTREAM ELEVATION(FEET) = 1300.00
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 177.15 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 87.39
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH(FEET) = 0.78
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 31.61
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.42
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.44
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 22.26
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.266
   STREET FLOW DEPTH(FEET) = 0.77
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 31.19
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
                                                                                                                                 αA
                                                                                                                                        SCS
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.27
                                                                                     LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.29
                                                                                 RESTDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 21.62
                                                                                 "3-4 DWELLINGS/ACRE" A
                                                                                                                2.39
                                                                                                                        0.98
                                                                                                                                0.600
```

Date: 04/21/2014 File name: LR0111ZZ.RES

Page 6

Page 5

```
COMMERCIAL
                      A 1.44 0.98 0.100 32
                                                                                    EFFECTIVE AREA(ACRES) = 59.71 AREA-AVERAGED Fm(INCH/HR) = 0.35
 RESIDENTIAL
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.36
 "5-7 DWELLINGS/ACRE" A 0.18 0.98 0.500 32
                                                                                   TOTAL AREA(ACRES) = 59.7 PEAK FLOW RATE(CFS) =
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.416
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 4.01 SUBAREA RUNOFF (CFS) = 6.71
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 EFFECTIVE AREA(ACRES) = 51.53 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.35
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 37.11
 TOTAL AREA (ACRES) = 51.5 PEAK FLOW RATE (CFS) =
                                                          89.05
                                                                                   FLOW VELOCITY (FEET/SEC.) = 3.58 DEPTH*VELOCITY (FT*FT/SEC.) = 3.18
                                                                                    LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11107.00 = 3897.08 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  **********************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    FLOW PROCESS FROM NODE 11107.00 TO NODE 11108.00 IS CODE = 63
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.80
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 3.48
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11106.00 = 3558.26 FEET.
                                                                                   >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  ______
****************
                                                                                   UPSTREAM ELEVATION(FEET) = 1296.00 DOWNSTREAM ELEVATION(FEET) = 1293.00
                                                                                   STREET LENGTH (FEET) = 344.59 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 11106.00 TO NODE 11107.00 IS CODE = 63
                                                                                   STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1298.00 DOWNSTREAM ELEVATION(FEET) = 1296.00
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 338.82 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     STREET FLOW DEPTH(FEET) = 0.85
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 35.27
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.18
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.56
   ***STREET FLOWING FULL***
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 25.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.103
   STREET FLOW DEPTH(FEET) = 0.88
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 36.80
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                            Fρ
                                                                                                                                     Дp
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.56
                                                                                        LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.14
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                         A 0.77
                                                                                                                            0.98
                                                                                                                                    0.600
 STREET FLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 23.85
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.174
                                                                                   COMMERCIAL
                                                                                                                 5.22
                                                                                                                            0.98
                                                                                                                                    0.100
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                   RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                    "5-7 DWELLINGS/ACRE"
                                                                                                         A 0.11
                                                                                                                            0.98
                                                                                                                                    0.500
                                      Fρ
                                                  αA
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 COMMERCIAL
                       A 2.92
                                         0.98
                                                  0.100 32
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.170
                                                                                   SUBAREA AREA (ACRES) = 6.10 SUBAREA RUNOFF (CFS) = 10.63
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.86
                                          0.98
                                                  0.600 32
                                                                                   EFFECTIVE AREA (ACRES) = 65.81 AREA-AVERAGED Fm (INCH/HR) = 0.34
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.35
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       A 0.40
                                          0.98
                                                  0.500
                                                                                   TOTAL AREA (ACRES) = 65.8 PEAK FLOW RATE (CFS) = 104.58
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.417
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 8.18
                                SUBAREA RUNOFF(CFS) = 13.02
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

File name: LR0111ZZ.RES

Date: 04/21/2014

Page 7 Date: 04/21/2014 File name: LR0111ZZ.RES Page 8

97.81

SCS

32

32

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.46
 FLOW VELOCITY (FEET/SEC.) = 4.20 DEPTH*VELOCITY (FT*FT/SEC.) = 3.59
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11108.00 = 4241.67 FEET.
******************
 FLOW PROCESS FROM NODE 11108.00 TO NODE 11109.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1293.00 DOWNSTREAM(FEET) = 1290.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 550.33 CHANNEL SLOPE = 0.0055
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 104.58
 FLOW VELOCITY (FEET/SEC.) = 3.86 FLOW DEPTH (FEET) = 1.75
 TRAVEL TIME (MIN.) = 2.38 Tc (MIN.) = 27.60
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11109.00 = 4792.00 FEET.
*******************
 FLOW PROCESS FROM NODE 11109.00 TO NODE 11109.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 27.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.992
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Ap SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    A 2.61
                                     0.98
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.52
                                     0.98
                                            0.600
                                                 32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   A 1.44
                                    0.98
                                            0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.283
 SUBAREA AREA(ACRES) = 4.57
                            SUBAREA RUNOFF (CFS) = 7.06
 EFFECTIVE AREA(ACRES) = 70.38 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 70.4
                            PEAK FLOW RATE (CFS) =
                                                  105.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 11109.00 TO NODE 11110.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1290.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 488.52 CHANNEL SLOPE = 0.0102
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 105.08
 FLOW VELOCITY (FEET/SEC.) = 4.79 FLOW DEPTH (FEET) = 1.47
```

```
TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 29.30
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11110.00 = 5280.52 FEET.
FLOW PROCESS FROM NODE 11110.00 TO NODE 11110.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 29.30
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.922
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                    A 3.24
                                  0.98
                                          0.100
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 2.34 0.98 0.500
                                                   32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
 SUBAREA AREA(ACRES) = 5.58 SUBAREA RUNOFF(CFS) = 8.34
 EFFECTIVE AREA(ACRES) = 75.96 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 76.0
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 11110.00 TO NODE 11111.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1280.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 580.02 CHANNEL SLOPE = 0.0086
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             108.98
 FLOW VELOCITY (FEET/SEC.) = 8.78 FLOW DEPTH (FEET) = 1.19
 TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 30.40
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11111.00 = 5860.54 FEET.
******************
 FLOW PROCESS FROM NODE 11111.00 TO NODE 11111.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 30.40
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.880
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                    Fρ
                                           αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   A 5.79
                                     0.98
                                            0.500
                                                   32
 COMMERCIAL
                      A
                           12.04
                                                   32
                                     0.98
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           12.62
                                     0.98
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.383
```

File name: LR011177.RFS

Page 10

Date: 04/21/2014

```
SUBAREA AREA(ACRES) = 30.45
                             SUBAREA RUNOFF (CFS) = 41.27
                                                                            >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 EFFECTIVE AREA(ACRES) = 106.41 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.35
                                                                            INITIAL SUBAREA FLOW-LENGTH (FEET) = 880.26
 TOTAL AREA (ACRES) = 106.4 PEAK FLOW RATE (CFS) = 147.37
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1395.00 DOWNSTREAM(FEET) = 1390.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                            SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.234
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.964
********************
                                                                            SUBAREA To AND LOSS RATE DATA (AMC II):
 FLOW PROCESS FROM NODE 11111.00 TO NODE 11153.00 IS CODE = 54
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fp
                                                                                LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                                A 7.01 0.98 0.250
                                                                            MOBILE HOME PARK
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                            RESIDENTIAL
_____
                                                                            "3-4 DWELLINGS/ACRE" A 2.73 0.98 0.600 32 17.45
 ELEVATION DATA: UPSTREAM(FEET) = 1280.00 DOWNSTREAM(FEET) = 1258.00
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1287.20 CHANNEL SLOPE = 0.0171
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.348
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
                                                                            SUBAREA RUNOFF (CFS) = 23.00
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
                                                                            TOTAL AREA(ACRES) = 9.74 PEAK FLOW RATE(CFS) =
 CHANNEL FLOW THRU SUBAREA(CFS) = 147.37
 FLOW VELOCITY (FEET/SEC.) = 12.18 FLOW DEPTH (FEET) = 1.17
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 32.16
                                                                            5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
 LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11153.00 = 7147.74 FEET.
                                                                           *******************
*******************
                                                                            FLOW PROCESS FROM NODE 11121.00 TO NODE 11122.00 IS CODE = 63
 FLOW PROCESS FROM NODE 11153.00 TO NODE 11153.00 IS CODE = 81
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                           _____
_____
 MAINLINE Tc(MIN.) = 32.16
                                                                            UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1388.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.817
                                                                            STREET LENGTH (FEET) = 185.87 CURB HEIGHT (INCHES) = 6.0
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            STREET HALFWIDTH (FEET) = 18.00
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fp
                                            Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 RESIDENTIAL
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "5-7 DWELLINGS/ACRE" B
                            0.01 0.75
                                             0.500
                                                   56
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RESIDENTIAL
                   A 5.86
 "5-7 DWELLINGS/ACRE"
                                    0.98
                                            0.500
                                                   32
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 COMMERCIAL
                    A 12.53
                                    0.98
                                             0.100 32
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.228
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA(ACRES) = 18.40
                           SUBAREA RUNOFF (CFS) = 26.42
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 EFFECTIVE AREA(ACRES) = 124.81 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                                                              **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.33
 TOTAL AREA(ACRES) = 124.8 PEAK FLOW RATE(CFS) =
                                                                              ***STREET FLOWING FULL***
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              STREET FLOW DEPTH (FEET) = 0.55
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 20.64
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.31
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.83
 FLOW PROCESS FROM NODE 11153.00 TO NODE 11153.00 IS CODE = 10
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 15.17
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.853
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                            SUBAREA LOSS RATE DATA (AMC II):
______
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fр
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
MOBILE HOME PARK
                                                                                                A 5.06 0.98 0.250
 FLOW PROCESS FROM NODE 11120.00 TO NODE 11121.00 IS CODE = 21
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" A 1.67 0.98 0.600
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

Page 11

Date: 04/21/2014

File name: LR0111ZZ.RES

Date: 04/21/2014 File name: LR0111ZZ.RES Page 12

SCS Tc

32 14.23

Ар

23.00

30.65

Αp

SCS

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.337
 SUBAREA AREA (ACRES) = 6.73 SUBAREA RUNOFF (CFS) = 15.29
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 16.47 AREA-AVERAGED Fm(INCH/HR) = 0.33
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 16.5 PEAK FLOW RATE (CFS) = 37.32
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   FLOW VELOCITY (FEET/SEC.) = 4.39 DEPTH*VELOCITY (FT*FT/SEC.) = 2.68
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
                                                                                    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                         AND L = 198.6 FT WITH ELEVATION-DROP = 3.0 FT, IS 28.4 CFS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11123.00
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
                                                                                    LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11123.00 = 1264.77 FEET.
 FLOW VELOCITY (FEET/SEC.) = 3.54 DEPTH*VELOCITY (FT*FT/SEC.) = 2.06
                                                                                  ******************
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 185.9 FT WITH ELEVATION-DROP = 2.0 FT, IS 26.2 CFS,
                                                                                    FLOW PROCESS FROM NODE 11123.00 TO NODE 11124.00 IS CODE = 63
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11122.00
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11122.00 = 1066.13 FEET.
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 FLOW PROCESS FROM NODE 11122.00 TO NODE 11123.00 IS CODE = 63
                                                                                    UPSTREAM ELEVATION(FEET) = 1385.00 DOWNSTREAM ELEVATION(FEET) = 1380.00
                                                                                    STREET LENGTH (FEET) = 331.32 CURB HEIGHT (INCHES) = 6.0
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 1388.00 DOWNSTREAM ELEVATION(FEET) = 1385.00
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 198.64 CURB HEIGHT (INCHES) = 6.0
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                       63.64
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     STREET FLOW DEPTH(FEET) = 0.65
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 25.40
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.67
   ***STREET FLOWING FULL***
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.02
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 17.14
   STREET FLOW DEPTH(FEET) = 0.59
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.651
   HALFSTREET FLOOD WIDTH (FEET) = 22.35
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.21
                                                                                                                         Fρ
                                                                                                                                           SCS
                                                                                   LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
MOBILE HOME PARK A 8.87 0.98 0.250 32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
 STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc(MIN.) = 15.95
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.767
                                                                                    RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" A 2.48 0.98 0.600
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                                                                            32
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                      Fр
                                                         SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
                                                                                    SUBAREA AREA (ACRES) = 11.35 SUBAREA RUNOFF (CFS) = 23.83
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.33
MOBILE HOME PARK A 5.75
                                          0.98
                                                  0.600 32
                                                                                    EFFECTIVE AREA(ACRES) = 34.90 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                         0.98
                                                0.250 32
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.33
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                    TOTAL AREA (ACRES) = 34.9 PEAK FLOW RATE (CFS) = 73.10
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.316
 SUBAREA AREA (ACRES) = 7.08 SUBAREA RUNOFF (CFS) = 15.67
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 23.55 AREA-AVERAGED Fm(INCH/HR) = 0.33
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 23.5 PEAK FLOW RATE (CFS) = 51.73
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
```

Date: 04/21/2014 File name: LR0111ZZ.RES Page 13

File name: LR0111ZZ.RES

Page 14

Date: 04/21/2014

```
DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.80
 FLOW VELOCITY (FEET/SEC.) = 4.84 DEPTH*VELOCITY (FT*FT/SEC.) = 3.27
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 331.3 FT WITH ELEVATION-DROP = 5.0 FT, IS 39.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11124.00
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11124.00 = 1596.09 FEET.
******************
 FLOW PROCESS FROM NODE 11124.00 TO NODE 11125.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1380.00 DOWNSTREAM ELEVATION(FEET) = 1370.00
 STREET LENGTH (FEET) = 346.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    84.71
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.64
  HALFSTREET FLOOD WIDTH (FEET) = 25.03
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.39
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.09
 STREET FLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 18.04
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.571
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.16 0.98 0.600 32
 MOBILE HOME PARK A 7.54 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.374
 SUBAREA AREA (ACRES) = 11.70 SUBAREA RUNOFF (CFS) = 23.23
 EFFECTIVE AREA(ACRES) = 46.60 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 46.6 PEAK FLOW RATE (CFS) = 93.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.07
 FLOW VELOCITY (FEET/SEC.) = 6.55 DEPTH*VELOCITY (FT*FT/SEC.) = 4.33
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 346.0 FT WITH ELEVATION-DROP = 10.0 FT, IS 43.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11125.00
```

```
******************
 FLOW PROCESS FROM NODE 11125.00 TO NODE 11126.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1370.00 DOWNSTREAM ELEVATION(FEET) = 1359.00
 STREET LENGTH (FEET) = 622.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.71
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.31
 STREET FLOW TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 19.86
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.427
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 21.92 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.92 SUBAREA RUNOFF(CFS) = 36.34
 EFFECTIVE AREA(ACRES) = 68.52 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.43
 TOTAL AREA (ACRES) = 68.5 PEAK FLOW RATE (CFS) = 124.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.93
 FLOW VELOCITY (FEET/SEC.) = 5.88 DEPTH*VELOCITY (FT*FT/SEC.) = 4.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 622.5 FT WITH ELEVATION-DROP = 11.0 FT, IS 52.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11126.00
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11126.00 = 2564.62 FEET.
FLOW PROCESS FROM NODE 11126.00 TO NODE 11127.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11125.00 = 1942.12 FEET.

Date: 04/21/2014 File name: LR0111ZZ.RES Page 15

File name: LR0111ZZ.RES

Date: 04/21/2014

Page 16

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA

>>>> (STREET TABLE SECTION # 5 USED) <<<<

UPSTREAM ELEVATION(FEET) = 1355.00 DOWNSTREAM ELEVATION(FEET) = 1352.00 STREET LENGTH(FEET) = 315.54 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 194.55
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.00
 HALFSTREET FLOOD WIDTH (FEET) = 43.16
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.12
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.14
STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 21.89
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.289
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                               28.58
                                          0.98
                                                  0.600
"3-4 DWELLINGS/ACRE"
                    A
                               12.99
MOBILE HOME PARK
                     В
                                         0.75
                                                  0.250
                                                          56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 12.02
                                          0.75
                                                  0.600
                      A 7.04
                                                          32
COMMERCIAL
                                          0.98
                                                  0.100
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B 4.98
                                         0.75
                                                  0.500
                                                          56
RESIDENTIAL
"5-7 DWELLINGS/ACRE" A 1.89 0.98 0.500
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.470
SUBAREA AREA (ACRES) = 67.50 SUBAREA RUNOFF (CFS) = 113.85
EFFECTIVE AREA(ACRES) = 147.24 AREA-AVERAGED Fm(INCH/HR) = 0.43
AREA-AVERAGED Fp(INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.46
TOTAL AREA (ACRES) = 147.2 PEAK FLOW RATE (CFS) = 246.67
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.09 HALFSTREET FLOOD WIDTH(FEET) = 47.43
FLOW VELOCITY (FEET/SEC.) = 5.39 DEPTH*VELOCITY (FT*FT/SEC.) = 5.87
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.2 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 24.94
PIPE-FLOW(CFS) = 137.62
PIPEFLOW TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 21.07
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.342
SUBAREA AREA (ACRES) = 67.50 SUBAREA RUNOFF (CFS) = 117.06
                                PEAK FLOW RATE (CFS) = 253.66
TOTAL AREA(ACRES) = 147.2
```

Date: 04/21/2014 File name: LR0111ZZ.RES Page 17 Date: 04/21/2014 File name: LR0111ZZ.RES Page 18

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 116.04
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.84
   HALFSTREET FLOOD WIDTH (FEET) = 35.16
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.56
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.84
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 315.5 FT WITH ELEVATION-DROP = 3.0 FT, IS 234.9 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11128.00
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11128.00 = 3196.66 FEET.
FLOW PROCESS FROM NODE 11128.00 TO NODE 11129.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1352.00 DOWNSTREAM ELEVATION (FEET) = 1345.00
 STREET LENGTH (FEET) = 664.38 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 262.84
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.09
   HALFSTREET FLOOD WIDTH (FEET) = 47.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.23
 STREET FLOW TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 23.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.221
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      A 1.26 0.98 0.100 32
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 10.83 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
 SUBAREA AREA(ACRES) = 12.09 SUBAREA RUNOFF(CFS) = 18.36
 EFFECTIVE AREA(ACRES) = 159.33 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 159.3 PEAK FLOW RATE (CFS) = 256.04
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.08 HALFSTREET FLOOD WIDTH(FEET) = 47.13
 FLOW VELOCITY (FEET/SEC.) = 5.67 DEPTH*VELOCITY (FT*FT/SEC.) = 6.14
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 23.25
 PIPE-FLOW(CFS) = 164.45
 PIPEFLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 21.55
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.311
 SUBAREA AREA(ACRES) = 12.09 SUBAREA RUNOFF(CFS) = 19.33
 TOTAL AREA (ACRES) = 159.3 PEAK FLOW RATE (CFS) = 268.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 104.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 33.03
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.71
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11129.00 = 3861.04 FEET.
******************
 FLOW PROCESS FROM NODE 11129.00 TO NODE 11130.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1345.00 DOWNSTREAM ELEVATION(FEET) = 1335.00
 STREET LENGTH (FEET) = 675.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                      276.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.06
   HALFSTREET FLOOD WIDTH (FEET) = 45.89
```

Date: 04/21/2014 File name: LR0111ZZ.RES

Page 20

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.60
                                                                                    STREET HALFWIDTH (FEET) = 26.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.03
 STREET FLOW TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 23.25
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.207
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                  0.600 32
 SCHOOL
                       A 1.18
                                         0.98
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 RESIDENTIAL
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 "3-4 DWELLINGS/ACRE" A 5.90
                                          0.98 0.600 32
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                  0.100 32
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
 COMMERCIAL
                      A
                                 2.75
                                         0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.460
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                        291.71
 SUBAREA AREA (ACRES) = 9.83 SUBAREA RUNOFF (CFS) = 15.56
                                                                                      ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 169.16 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
                                                                                      STREET FLOW DEPTH (FEET) = 1.08
 TOTAL AREA (ACRES) = 169.2 PEAK FLOW RATE (CFS) = 269.61
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 46.75
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.26
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 2.51 Tc (MIN.) = 24.47
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 1.06 HALFSTREET FLOOD WIDTH(FEET) = 45.47
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
 FLOW VELOCITY (FEET/SEC.) = 6.56 DEPTH*VELOCITY (FT*FT/SEC.) = 6.92
                                                                                         LAND USE
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    RESIDENTIAL
                                                                                    "3-4 DWELLINGS/ACRE"
                                                                                                          A 14.65 0.98 0.600 32
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                                                  0.09 0.98 0.600 32
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
                                                                                                           A
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                    SUBAREA AREA (ACRES) = 14.74 SUBAREA RUNOFF (CFS) = 20.64
                                                                                    EFFECTIVE AREA(ACRES) = 183.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.55
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.48
 PIPE-FLOW(CFS) = 194.94
                                                                                    TOTAL AREA (ACRES) = 183.9 PEAK FLOW RATE (CFS) = 281.39
 PIPEFLOW TRAVEL TIME (MIN.) = 0.41 Tc (MIN.) = 21.96
                                                                                    NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.285
 SUBAREA AREA(ACRES) = 9.83 SUBAREA RUNOFF(CFS) = 16.24
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA(ACRES) = 169.2
                                 PEAK FLOW RATE (CFS) = 281.39
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                    DEPTH (FEET) = 1.07 HALFSTREET FLOOD WIDTH (FEET) = 46.14
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                    FLOW VELOCITY (FEET/SEC.) = 6.64 DEPTH*VELOCITY (FT*FT/SEC.) = 7.10
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.45
   ***STREET FLOWING FULL***
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
   STREET FLOW DEPTH (FEET) = 0.75
                                                                                    SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
   HALFSTREET FLOOD WIDTH (FEET) = 30.33
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.76
                                                                                    ESTIMATED PIPE DIAMETER (INCH) = 36.00
                                                                                                                         NUMBER OF PIPES = 1
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.58
                                                                                    ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11130.00 = 4536.54 FEET.
                                                                                    PIPE-FLOW VELOCITY(FEET/SEC.) = 27.60
                                                                                    PIPE-FLOW(CFS) = 195.25
******************
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 22.57
 FLOW PROCESS FROM NODE 11130.00 TO NODE 11131.00 IS CODE = 63
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.248
______
                                                                                    SUBAREA AREA(ACRES) = 14.74 SUBAREA RUNOFF(CFS) = 22.06
                                                                                    TOTAL AREA(ACRES) = 183.9
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                                                     PEAK FLOW RATE (CFS) = 297.77
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 UPSTREAM ELEVATION(FEET) = 1335.00 DOWNSTREAM ELEVATION(FEET) = 1320.00
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET LENGTH (FEET) = 1010.00 CURB HEIGHT (INCHES) = 8.0
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE To:
```

Page 21

Date: 04/21/2014

File name: LR0111ZZ.RES

Date: 04/21/2014 File name: LR0111ZZ.RES Page 22

SCS

```
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 102.52
                                                                                    FLOW VELOCITY (FEET/SEC.) = 6.06 DEPTH*VELOCITY (FT*FT/SEC.) = 8.12
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   STREET FLOW DEPTH(FEET) = 0.79
                                                                                          THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   HALFSTREET FLOOD WIDTH (FEET) = 32.10
                                                                                    SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.03
                                                                                    ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.97
                                                                                    ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11131.00 = 5546.54 FEET.
                                                                                    ASSUME FULL-FLOWING PIPELINE
                                                                                    PIPE-FLOW VELOCITY(FEET/SEC.) = 24.92
*******************
                                                                                    PIPE-FLOW(CFS) = 275.47
 FLOW PROCESS FROM NODE 11131.00 TO NODE 11132.00 IS CODE = 63
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 0.67 Tc (MIN.) = 23.24
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.208
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    SUBAREA AREA(ACRES) = 114.48 SUBAREA RUNOFF(CFS) = 169.47
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                    TOTAL AREA (ACRES) = 298.4 PEAK FLOW RATE (CFS) = 460.78
_____
 UPSTREAM ELEVATION (FEET) = 1320.00 DOWNSTREAM ELEVATION (FEET) = 1311.00
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET LENGTH (FEET) = 1001.00 CURB HEIGHT (INCHES) = 8.0
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET HALFWIDTH (FEET) = 26.00
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 185.31
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                      ***STREET FLOWING FULL***
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      STREET FLOW DEPTH(FEET) = 1.01
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 43.39
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.95
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.02
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                          AND L = 1001.0 FT WITH ELEVATION-DROP = 9.0 FT, IS 274.1 CFS,
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                          WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11132.00
                                                                                    LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11132.00 = 6547.54 FEET.
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 376.65
                                                                                   ******************
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     FLOW PROCESS FROM NODE 11132.00 TO NODE 11152.00 IS CODE = 63
   STREET FLOW DEPTH(FEET) = 1.28
                                                                                   ______
   HALFSTREET FLOOD WIDTH (FEET) = 56.70
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.88
                                                                                    >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                   _____
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.53
 STREET FLOW TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 25.41
                                                                                    UPSTREAM ELEVATION(FEET) = 1311.00 DOWNSTREAM ELEVATION(FEET) = 1300.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.093
                                                                                    STREET LENGTH (FEET) = 662.69 CURB HEIGHT (INCHES) = 8.0
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    STREET HALFWIDTH (FEET) = 26.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                  Αp
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 RESIDENTIAL
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE"
                       A 100.00
                                                0.600 32
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                        0.98
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                               9.46
                                          0.98
                                                  0.600 32
                       A
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
                                 5.02
                                                  0.100 32
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                         Α
                                          0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.578
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                              SUBAREA RUNOFF(CFS) = 157.61
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
 SUBAREA AREA(ACRES) = 114.48
 EFFECTIVE AREA(ACRES) = 298.38 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.52
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TOTAL AREA (ACRES) = 298.4 PEAK FLOW RATE (CFS) = 429.86
                                                                                      ***STREET FLOWING FULL***
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      STREET FLOW DEPTH (FEET) = 1.24
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 54.44
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.80
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.64
 DEPTH(FEET) = 1.34 HALFSTREET FLOOD WIDTH(FEET) = 59.63
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 24.65
```

Date: 04/21/2014 Date: 04/21/2014 File name: LR0111ZZ.RES Page 23 File name: LR0111ZZ.RES

460.78

Page 24

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.132
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 298.38 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.52
 TOTAL AREA (ACRES) = 298.4 PEAK FLOW RATE (CFS) = 460.78
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.58
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 1.24 HALFSTREET FLOOD WIDTH (FEET) = 54.44
 FLOW VELOCITY (FEET/SEC.) = 7.80 DEPTH*VELOCITY (FT*FT/SEC.) = 9.64
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 32.34
 PIPE-FLOW(CFS) = 311.38
 PIPEFLOW TRAVEL TIME (MIN.) = 0.34 Tc (MIN.) = 23.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.189
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 TOTAL AREA(ACRES) = 298.4 PEAK FLOW RATE(CFS) = 460.78
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.58
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 149.39
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.06
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11152.00 = 7210.23 FEET.
*****************
 FLOW PROCESS FROM NODE 11152.00 TO NODE 11152.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.58
 RAINFALL INTENSITY (INCH/HR) = 2.19
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.96
 AREA-AVERAGED Ap = 0.52
 EFFECTIVE STREAM AREA(ACRES) = 298.38
 TOTAL STREAM AREA(ACRES) = 298.38
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 460.78
******************
 FLOW PROCESS FROM NODE 11140.00 TO NODE 11141.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 767.28
 ELEVATION DATA: UPSTREAM(FEET) = 1398.00 DOWNSTREAM(FEET) = 1388.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.411
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.384
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS To
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                    A 6.95 0.98
                                                     32 11.41
 MOBILE HOME PARK
                                            0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.20 0.98 0.600
                                                     32 13.99
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.334
 SUBAREA RUNOFF(CFS) = 25.18
 TOTAL AREA(ACRES) = 9.15 PEAK FLOW RATE(CFS) =
                                                25.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
******************
 FLOW PROCESS FROM NODE 11141.00 TO NODE 11142.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1388.00 DOWNSTREAM ELEVATION(FEET) = 1385.00
 STREET LENGTH (FEET) = 156.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                34.93
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 20.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.27
 STREET FLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 12.06
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.273
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                             Ар
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK A 6.77 0.98 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.43 0.98 0.600
```

File name: LR0111ZZ.RES

Page 26

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.271
 SUBAREA AREA(ACRES) = 7.20 SUBAREA RUNOFF(CFS) = 19.50
 EFFECTIVE AREA(ACRES) = 16.35 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.31
 TOTAL AREA (ACRES) = 16.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 22.35
 FLOW VELOCITY (FEET/SEC.) = 4.22 DEPTH*VELOCITY (FT*FT/SEC.) = 2.55
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11142.00 = 923.78 FEET.
*****************
 FLOW PROCESS FROM NODE 11142.00 TO NODE 11143.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1385.00 DOWNSTREAM ELEVATION(FEET) = 1380.00
 STREET LENGTH (FEET) = 234.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.94
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.68
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.92
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc(MIN.) = 12.90
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.143
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp Ap SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 1.20
                                         0.98 0.600 32
                                                 0.250 32
 MOBILE HOME PARK
                       Α
                                6.51
                                         0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.304
 SUBAREA AREA(ACRES) = 7.71 SUBAREA RUNOFF(CFS) = 19.75
 EFFECTIVE AREA(ACRES) = 24.06 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.31
 TOTAL AREA (ACRES) = 24.1 PEAK FLOW RATE (CFS) = 61.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.01
 FLOW VELOCITY (FEET/SEC.) = 4.78 DEPTH*VELOCITY (FT*FT/SEC.) = 3.15
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11143.00 = 1158.28 FEET.
*******************
 FLOW PROCESS FROM NODE 11143.00 TO NODE 11144.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1380.00 DOWNSTREAM ELEVATION(FEET) = 1375.00
 STREET LENGTH (FEET) = 220.12 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.93
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  70.68
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.62
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.44
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 13.63
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.042
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                               αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.42
                                        0.98 0.600
                     A 5.96 0.98 0.250 32
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.317
 SUBAREA AREA (ACRES) = 7.38 SUBAREA RUNOFF (CFS) = 18.15
 EFFECTIVE AREA(ACRES) = 31.44 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.31
 TOTAL AREA (ACRES) = 31.4 PEAK FLOW RATE (CFS) = 77.56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.50
 FLOW VELOCITY (FEET/SEC.) = 5.18 DEPTH*VELOCITY (FT*FT/SEC.) = 3.61
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11144.00 = 1378.40 FEET.
*****************
 FLOW PROCESS FROM NODE 11144.00 TO NODE 11145.00 IS CODE = 63
```

Date: 04/21/2014 File name: LR0111ZZ.RES Page 27 Date: 04/21/2014 File name: LR0111ZZ.RES Page 28

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1375.00 DOWNSTREAM ELEVATION(FEET) = 1370.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 313.00 CURB HEIGHT (INCHES) = 8.0
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 112.38
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET FLOW DEPTH(FEET) = 0.81
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 39.10
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.99
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.03
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.01
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 15.73
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.791
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   91.93
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.77
                                                                                      LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 36.00
                                                                                  RESIDENTIAL
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.64
                                                                                  "3-4 DWELLINGS/ACRE" A 9.51 0.98 0.600
                                                                                                              0.56 0.98 0.250 32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.59
                                                                                  MOBILE HOME PARK
                                                                                                       A
 STREET FLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 14.75
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.901
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.581
                                                                                  SUBAREA AREA (ACRES) = 10.07 SUBAREA RUNOFF (CFS) = 20.17
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  EFFECTIVE AREA(ACRES) = 53.91 AREA-AVERAGED Fm(INCH/HR) = 0.36
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Дp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.37
                                                                                  TOTAL AREA (ACRES) = 53.9 PEAK FLOW RATE (CFS) = 118.16
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.01
                                      0.98 0.600 32
                              9.39 0.98
                                                 0.250 32
 MOBILE HOME PARK
                      A
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.335
 SUBAREA AREA(ACRES) = 12.40
                             SUBAREA RUNOFF (CFS) = 28.73
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 43.84 AREA-AVERAGED Fm(INCH/HR) = 0.31
                                                                                  DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 39.58
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.32
                                                                                  FLOW VELOCITY (FEET/SEC.) = 5.07 DEPTH*VELOCITY (FT*FT/SEC.) = 4.15
 TOTAL AREA(ACRES) = 43.8
                                PEAK FLOW RATE (CFS) =
                                                                                  LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11146.00 = 1982.90 FEET.
                                                       102.29
                                                                                ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  FLOW PROCESS FROM NODE 11146.00 TO NODE 11147.00 IS CODE = 63
                                                                                 ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 38.50
                                                                                  >>>> (STREET TABLE SECTION # 13 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 4.72 DEPTH*VELOCITY (FT*FT/SEC.) = 3.77
                                                                                ______
                                                                                  UPSTREAM ELEVATION (FEET) = 1365.00 DOWNSTREAM ELEVATION (FEET) = 1357.00
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11145.00 = 1691.40 FEET.
                                                                                  STREET LENGTH (FEET) = 397.50 CURB HEIGHT (INCHES) = 8.0
******************
                                                                                  STREET HALFWIDTH (FEET) = 32.00
 FLOW PROCESS FROM NODE 11145.00 TO NODE 11146.00 IS CODE = 63
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1370.00 DOWNSTREAM ELEVATION(FEET) = 1365.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 291.50 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.96
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Page 29

Date: 04/21/2014

File name: LR0111ZZ.RES

Date: 04/21/2014 File name: LR0111ZZ.RES Page 30

SCS

32

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 39.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.42
 STREET FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 16.94
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.669
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.97 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 5.97 SUBAREA RUNOFF(CFS) = 11.20
 EFFECTIVE AREA(ACRES) = 59.88 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 59.9
                                PEAK FLOW RATE (CFS) = 123.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 39.22
 FLOW VELOCITY (FEET/SEC.) = 5.43 DEPTH*VELOCITY (FT*FT/SEC.) = 4.41
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11147.00 = 2380.40 FEET.
FLOW PROCESS FROM NODE 11147.00 TO NODE 11148.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1357.00 DOWNSTREAM ELEVATION(FEET) = 1353.00
 STREET LENGTH (FEET) = 412.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 128.71
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 43.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.86
 STREET FLOW TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 18.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.529
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                        Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                              0.05
                                         0.98
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.98 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 6.03 SUBAREA RUNOFF (CFS) = 10.55
 EFFECTIVE AREA(ACRES) = 65.91 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.41
 TOTAL AREA (ACRES) = 65.9 PEAK FLOW RATE (CFS) = 126.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.90 HALFSTREET FLOOD WIDTH (FEET) = 43.43
 FLOW VELOCITY (FEET/SEC.) = 4.26 DEPTH*VELOCITY (FT*FT/SEC.) = 3.81
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11148.00 = 2792.90 FEET.
******************
 FLOW PROCESS FROM NODE 11148.00 TO NODE 11149.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1353.00 DOWNSTREAM ELEVATION(FEET) = 1350.00
 STREET LENGTH (FEET) = 248.60 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 131.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 42.57
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.09
 STREET FLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 19.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.458
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
  DEVELOPMENT TYPE/
                                     Fρ
                                               αA
                                                        SCS
  LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                              0.20 0.98
                                               0.600
 SCHOOL
                      A
 RESIDENTIAL
                      A 5.51 0.98 0.600
 "3-4 DWELLINGS/ACRE"
                      A 0.19 0.98 0.100
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
```

Date: 04/21/2014 File name: LR0111ZZ.RES

Page 32

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.584
 SUBAREA AREA(ACRES) = 5.90
                               SUBAREA RUNOFF(CFS) = 10.03
 EFFECTIVE AREA(ACRES) = 71.81 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.42
 TOTAL AREA (ACRES) = 71.8 PEAK FLOW RATE (CFS) = 132.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 42.64
 FLOW VELOCITY(FEET/SEC.) = 4.67 DEPTH*VELOCITY(FT*FT/SEC.) = 4.11
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11149.00 = 3041.50 FEET.
*******************
 FLOW PROCESS FROM NODE 11149.00 TO NODE 11150.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1350.00 DOWNSTREAM ELEVATION (FEET) = 1340.00
 STREET LENGTH (FEET) = 668.04 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 142.13
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.81
 STREET FLOW TRAVEL TIME (MIN.) = 2.00 Tc (MIN.) = 21.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.318
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                 Ар
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                7.86
                                                 0.600 32
                     A
                                        0.98
                                                 0.600 32
 SCHOOL
                        Α
                                4.14
                                         0.98
                                                 0.100 32
 COMMERCIAL
                                0.51
                                        0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.580
 SUBAREA AREA (ACRES) = 12.51 SUBAREA RUNOFF (CFS) = 19.74
 EFFECTIVE AREA(ACRES) = 84.32 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 84.3 PEAK FLOW RATE (CFS) = 142.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.01
 FLOW VELOCITY (FEET/SEC.) = 5.56 DEPTH*VELOCITY (FT*FT/SEC.) = 4.82
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11150.00 = 3709.54 FEET.
*****************
 FLOW PROCESS FROM NODE 11150.00 TO NODE 11151.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1340.00 DOWNSTREAM ELEVATION(FEET) = 1318.00
 STREET LENGTH (FEET) = 1208.52 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.95
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   159.13
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.13
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.15
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.34
 STREET FLOW TRAVEL TIME (MIN.) = 3.28 Tc (MIN.) = 24.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.128
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 23.26
                                          0.98 0.600 32
                       A
                              0.04 0.98 0.600 32
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 23.30 SUBAREA RUNOFF (CFS) = 32.37
 EFFECTIVE AREA(ACRES) = 107.62 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.48
 TOTAL AREA(ACRES) = 107.6 PEAK FLOW RATE(CFS) = 160.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.25
 FLOW VELOCITY (FEET/SEC.) = 6.17 DEPTH*VELOCITY (FT*FT/SEC.) = 5.38
 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11151.00 = 4918.06 FEET.
```

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

Date: 04/21/2014 File name: LR0111ZZ.RES Page 33 Date: 04/21/2014 File name: LR0111ZZ.RES Page 34

```
FLOW PROCESS FROM NODE 11151.00 TO NODE 11152.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1318.00 DOWNSTREAM ELEVATION(FEET) = 1300.00
 STREET LENGTH (FEET) = 810.03 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 171.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.76
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.83
 STREET FLOW TRAVEL TIME (MIN.) = 2.00 Tc (MIN.) = 26.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.032
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                αA
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 15.99
                                         0.98
                                                 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600 56
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA(ACRES) = 16.21 SUBAREA RUNOFF(CFS) = 21.13 EFFECTIVE AREA(ACRES) = 123.83 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.50TOTAL AREA (ACRES) = 123.8 PEAK FLOW RATE (CFS) = 172.65

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.88 FLOW VELOCITY (FEET/SEC.) = 6.76 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.84 LONGEST FLOWPATH FROM NODE 11140.00 TO NODE 11152.00 = 5728.09 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11152.00 TO NODE 11152.00 IS CODE = 1

\_\_\_\_\_\_

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<

\_\_\_\_\_ TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

EFFECTIVE STREAM AREA(ACRES) = 123.83 TOTAL STREAM AREA(ACRES) = 123.83 PEAK FLOW RATE (CFS) AT CONFLUENCE = 172.65 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 460.78 23.58 2.189 0.96(0.49) 0.52 298.4 11120.00 2 172.65 26.71 2.032 0.97(0.48) 0.50 123.8 11140.00

TIME OF CONCENTRATION (MIN.) = 26.71RAINFALL INTENSITY (INCH/HR) = 2.03

AREA-AVERAGED Fm(INCH/HR) = 0.48

AREA-AVERAGED Fp (INCH/HR) = 0.97

AREA-AVERAGED Ap = 0.50

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

## \*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	628.71	23.58	2.189	0.96( 0.49)	0.51	407.7	11120.00
2	590.59	26.71	2.032	0.96(0.49)	0.51	422.2	11140.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 628.71 Tc (MIN.) = 23.58EFFECTIVE AREA(ACRES) = 407.70 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.51 TOTAL AREA(ACRES) = 422.2 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11152.00 = 7210.23 FEET.

\*

FLOW PROCESS FROM NODE 11152.00 TO NODE 11153.00 IS CODE = 63 \_\_\_\_\_\_

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 18 USED) <<<<

\_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1300.00 DOWNSTREAM ELEVATION(FEET) = 1258.00 STREET LENGTH (FEET) = 2580.10 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 674.18 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 1.41

HALFSTREET FLOOD WIDTH (FEET) = 63.23 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.46 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 11.93

Date: 04/21/2014

Date: 04/21/2014 File name: LR0111ZZ.RES Page 35 File name: LR0111ZZ.RES

Page 36

STREET FLOW TRAVEL TIME (MIN.) = 5.09 Tc (MIN.) = 28.66 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.947 SUBAREA LOSS RATE DATA (AMC II):	PEAK FLOW RATE(CFS) = 700.82 Tc(MIN.) = 24.76  AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.96  AREA-AVERAGED Ap = 0.48 EFFECTIVE AREA(ACRES) = 466.89
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11153.00 = 9790.33 FEET.
COMMERCIAL A 27.28 0.98 0.100 32	*******************
COMMERCIAL         A         27.28         0.98         0.100         32           MOBILE HOME PARK         A         16.76         0.98         0.250         32	FLOW PROCESS FROM NODE 11153.00 TO NODE 11153.00 IS CODE = 11
"3-4 DWELLINGS/ACRE" A 11.51 0.98 0.600 32  MOBILE HOME PARK B 1.73 0.75 0.250 56  COMMERCIAL B 1.22 0.75 0.100 56	>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
MOBILE HOME PARK B 1.73 0.75 0.250 56	
COMMERCIAL B 1.22 0.75 0.100 56	
RESIDENTIAL	** MAIN STREAM CONFLUENCE DATA **
"3-4 DWELLINGS/ACRE" B 0.69 0.75 0.600 56	STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96	NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250	1 700.82 24.76 2.126 0.96(0.46) 0.48 466.9 11120.00
SUBAREA AREA (ACRES) = 59.19 SUBAREA RUNOFF (CFS) = 90.94	2 657.91 27.94 1.977 0.96( 0.46) 0.48 481.4 11140.00
EFFECTIVE AREA(ACRES) = 466.89 AREA-AVERAGED Fm(INCH/HR) = 0.46	LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11153.00 = 9790.33 FEET.
AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.48	BONGEOT THOMATIN TROM NODE TITZO. OF TO NODE TITZO. OF THE TITZO.
TOTAL AREA (ACRES) = 481.4 PEAK FLOW RATE (CFS) = 628.71	** MEMORY BANK # 1 CONFLUENCE DATA **
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE	STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER
NOIE. FEAR FLOW RAIE DEFAULTED TO UTSIREAM VALUE	NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	1 167.81 32.16 1.817 0.97 (0.32) 0.33 124.8 11100.00
505ARDA ARDA-AVERAGED RAINFALL DEFIN(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50	LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11153.00 = 7147.74 FEET.
3M = 0.40; 30M = 0.93; 1HR = 1.23; 3HR = 2.03; 6HR = 2.73; 24HR = 3.30	LONGEST FLOWPATH FROM NODE 11100.00 TO NODE 11155.00 = /14/./4 FEET.
END OF SUBAREA STREET FLOW HYDRAULICS:	** PEAK FLOW RATE TABLE **
DEPTH(FEET) = 1.38 HALFSTREET FLOOD WIDTH(FEET) = 61.58	STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER
FLOW VELOCITY (FEET/SEC.) = 8.31 DEPTH*VELOCITY (FT*FT/SEC.) = 11.46	
FLOW VELOCITY (FEET/SEC.) = 8.31 DEPTH-VELOCITY (FT-FT/SEC.) = 11.46	
*NOME, ECHIMANED CHOPEN ELOW DEDMI IC CREAMED MIAN	· · · · · · · · · · · · · · · · · · ·
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN	
THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98	3 756.29 32.16 1.817 0.96(0.43) 0.45 606.2 11100.00
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:	TOTAL AREA (ACRES) = 606.2
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **	CONTRACTOR CONTRACTOR TOTAL TOTAL AND A STATE OF THE STAT
ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1	COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
ASSUME FULL-FLOWING PIPELINE	PEAK FLOW RATE(CFS) = 856.71 Tc(MIN.) = 24.758
PIPE-FLOW VELOCITY (FEET/SEC.) = 36.45	EFFECTIVE AREA (ACRES) = 562.97 AREA-AVERAGED Fm (INCH/HR) = 0.44
PIPE-FLOW(CFS) = 517.54	AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.45
PIPEFLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 24.76	TOTAL AREA (ACRES) = 606.2
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.126	LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11153.00 = 9790.33 FEET.
SUBAREA AREA(ACRES) = 59.19 SUBAREA RUNOFF(CFS) = 100.47	*************
TOTAL AREA (ACRES) = 481.4 PEAK FLOW RATE (CFS) = 700.82	
	FLOW PROCESS FROM NODE 11153.00 TO NODE 11153.00 IS CODE = 12
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50	>>>>CLEAR MEMORY BANK # 1 <<<<
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :	=======================================
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 183.29	
***STREET FLOWING FULL***	******************
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	FLOW PROCESS FROM NODE 11153.00 TO NODE 11154.00 IS CODE = 54
STREET FLOW DEPTH(FEET) = 0.92	
HALFSTREET FLOOD WIDTH (FEET) = 38.75	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.15	>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.67	
	ELEVATION DATA: UPSTREAM(FEET) = 1258.00 DOWNSTREAM(FEET) = 1257.00
** PEAK FLOW RATE TABLE **	CHANNEL LENGTH THRU SUBAREA(FEET) = 1299.38 CHANNEL SLOPE = 0.0008
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER	CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 9.00
1 700.82 24.76 2.126 0.96(0.46) 0.48 466.9 11120.00	CHANNEL FLOW THRU SUBAREA(CFS) = 856.71
2 657.91 27.94 1.977 0.96(0.46) 0.48 481.4 11140.00	FLOW VELOCITY(FEET/SEC.) = 6.48 FLOW DEPTH(FEET) = 6.37
NEW PEAK FLOW DATA ARE:	TRAVEL TIME (MIN.) = 3.34 Tc (MIN.) = 28.10

Date: 04/21/2014 File name: LR0111ZZ.RES Page 37

File name: LR0111ZZ.RES Page 38

Date: 04/21/2014

LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11154.00 = 11089.71 FEET. >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< FLOW PROCESS FROM NODE 11154.00 TO NODE 11154.00 IS CODE = 81 \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1257.00 DOWNSTREAM(FEET) = 1252.00 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> CHANNEL LENGTH THRU SUBAREA (FEET) = 1418.25 CHANNEL SLOPE = 0.0035 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000 MAINLINE Tc(MIN.) = 28.10MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.970 CHANNEL FLOW THRU SUBAREA(CFS) = 934.56 SUBAREA LOSS RATE DATA(AMC II): FLOW VELOCITY (FEET/SEC.) = 11.65 FLOW DEPTH (FEET) = 4.64 TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 30.13DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11155.00 = 12507.96 FEET. COMMERCIAL В 18.88 0.75 0.100 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* RESIDENTIAL "3-4 DWELLINGS/ACRE" A 18.38 0.98 0.600 32 FLOW PROCESS FROM NODE 11155.00 TO NODE 11155.00 IS CODE = 81 \_\_\_\_\_\_ RESIDENTIAL B 14.24 "5-7 DWELLINGS/ACRE" 0.75 0.500 56 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< A 13.60 0.98 0.100 32 \_\_\_\_\_\_ COMMERCIAL MOBILE HOME PARK 10.81 0.98 0.250 MAINLINE Tc(MIN.) = 30.13RESIDENTIAL \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.890 "3-4 DWELLINGS/ACRE" B 6.56 0.75 0.600 56 SUBAREA LOSS RATE DATA (AMC II): SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87 DEVELOPMENT TYPE/ SCS SOIL AREA Fр SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.340 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN SUBAREA AREA(ACRES) = 82.47 SUBAREA RUNOFF (CFS) = 124.30COMMERCIAL В 28.26 0.75 0.100 EFFECTIVE AREA(ACRES) = 645.44 AREA-AVERAGED Fm(INCH/HR) = 0.42 RESIDENTIAL AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.44 "3-4 DWELLINGS/ACRE" в 18.98 0.75 0.600 B 14.02 0.250 TOTAL AREA (ACRES) = 688.7 PEAK FLOW RATE(CFS) = 902.20 MOBILE HOME PARK 0.75 RESIDENTIAL "5-7 DWELLINGS/ACRE" В 12.58 0.75 0.500 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.40MOBILE HOME PARK 11.82 0.98 0.250 RESIDENTIAL \*\*\*\*\* "3-4 DWELLINGS/ACRE" A 3.32 0.98 0.600 FLOW PROCESS FROM NODE 11154.00 TO NODE 11154.00 IS CODE = 71 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.79 \_\_\_\_\_\_ SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD< SUBAREA AREA(ACRES) = 88.98 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH< UNIT-HYDROGRAPH DATA: \_\_\_\_\_\_ RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.81;6H= 2.45;24H= 4.80 UNIT-HYDROGRAPH DATA: S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0% RAINFALL(INCH): 5M= 0.42;30M= 0.87;1H= 1.14;3H= 1.86;6H= 2.52;24H= 4.97 MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% S-GRAPH: VALLEY (DEV.) = 100.0%; VALLEY (UNDEV.) / DESERT= 0.0% Tc(HR) = 0.50; LAG(HR) = 0.40; Fm(INCH/HR) = 0.40; Ybar = 0.44 MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. Tc(HR) = 0.47; LAG(HR) = 0.37; Fm(INCH/HR) = 0.41; Ybar = 0.45 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. 3HR = 0.99; 6HR = 1.00; 24HR = 1.00DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 777.7 3HR = 1.00; 6HR = 1.00; 24HR = 1.00LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11155.00 = 12507.96 FEET. UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 688.7 EOUIVALENT BASIN FACTOR APPROXIMATIONS: LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11154.00 = 11089.71 FEET. Lca/L=0.3, n=.0299; Lca/L=0.4, n=.0268; Lca/L=0.5, n=.0246; Lca/L=0.6, n=.0230 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 185.63 EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0311; Lca/L=0.4, n=.0279; Lca/L=0.5, n=.0256; Lca/L=0.6, n=.0239 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 945.58 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 166.68 TOTAL AREA (ACRES) = 777.7 PEAK FLOW RATE (CFS) = 945.58UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 934.56 TOTAL PEAK FLOW RATE (CFS) = 934.56 (SOURCE FLOW INCLUDED) SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

FLOW PROCESS FROM NODE 11154.00 TO NODE 11155.00 IS CODE = 54

RATIONAL METHOD PEAK FLOW RATE (CFS) = 902.20

PEAK FLOW RATE (CFS) USED = 934.56

(UPSTREAM NODE PEAK FLOW RATE (CFS) = 902.20)

Date: 04/21/2014 File name: LR0111ZZ.RES Page 39

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

Date: 04/21/2014

5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.45

FLOW PROCESS FROM NODE 11155.00 TO NODE 11156.00 IS CODE = 54

File name: LR0111ZZ.RES Page 40

56

56

56

32

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             CHANNEL LENGTH THRU SUBAREA (FEET) = 2187.11 CHANNEL SLOPE = 0.0046
                                                                             CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 ELEVATION DATA: UPSTREAM(FEET) = 1252.00 DOWNSTREAM(FEET) = 1250.00
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1431.00 CHANNEL SLOPE = 0.0014
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 1003.91
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
                                                                            FLOW VELOCITY (FEET/SEC.) = 13.07 FLOW DEPTH (FEET) = 4.51
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
                                                                            TRAVEL TIME (MIN.) = 2.79 Tc (MIN.) = 35.79
 CHANNEL FLOW THRU SUBAREA(CFS) = 945.58
                                                                            LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11157.00 = 16126.07 FEET.
 FLOW VELOCITY (FEET/SEC.) = 8.30 FLOW DEPTH (FEET) = 5.81
                                                                           ******************
 TRAVEL TIME (MIN.) = 2.87 Tc (MIN.) = 33.00
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11156.00 = 13938.96 FEET.
                                                                            FLOW PROCESS FROM NODE 11157.00 TO NODE 11157.00 IS CODE = 81
                                                                           ______
******************
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 11156.00 TO NODE 11156.00 IS CODE = 81
                                                                            MAINLINE Tc(MIN.) = 35.79
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.704
______
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                                                              Fр
 MAINLINE Tc(MIN.) = 33.00
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.789
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 SUBAREA LOSS RATE DATA(AMC II):
                                                                            RESIDENTIAL
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                                    SCS
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                        5.40
                                                                                                                  0.75
                                   Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                  В
                                                                                                        100.00
                                                                                                                  0.75
     LAND USE
                                                                            COMMERCIAL
 COMMERCIAL
                     A
                            26.66
                                      0.98
                                             0.100 32
                                                                            COMMERCIAL
                                                                                                  В
                                                                                                       2.71
                                                                                                                  0.75
 COMMERCIAL
                      В
                            29.20
                                      0.75
                                              0.100 56
                                                                            RESIDENTIAL
                     A
                                                     32
 MOBILE HOME PARK
                            5.04
                                      0.98
                                              0.250
                                                                            "5-7 DWELLINGS/ACRE"
                                                                                                в 8.39
                                                                                                                  0.75
 MOBILE HOME PARK
                     В
                            3.45
                                      0.75
                                              0.250
                                                                            RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                        1.54
                                                                                                                  0.98
 RESIDENTIAL
                                                                                                  Α
                                              0.500
                                                                                                         26.33
 "5-7 DWELLINGS/ACRE" B 21.44
                                      0.75
                                                                            COMMERCIAL.
                                                                                                  Α
                                                                                                                 0.98 0.100
 RESIDENTIAL
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.79
 "3-4 DWELLINGS/ACRE"
                            5.28
                                      0.75
                                            0.600 56
                   В
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.147
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.79
                                                                             SUBAREA AREA(ACRES) = 144.37
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.237
                                                                            UNIT-HYDROGRAPH DATA:
 SUBAREA AREA(ACRES) = 91.07
                                                                            RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.80;6H= 2.45;24H= 4.78
                                                                             S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.40;30M= 0.82;1H= 1.08;3H= 1.76;6H= 2.39;24H= 4.66
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 S-GRAPH: VALLEY (DEV.)=100.0%; VALLEY (UNDEV.) / DESERT= 0.0%
                                                                            Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.34; Ybar = 0.38
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.37; Ybar = 0.42
                                                                            DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1013.1
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                            LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11157.00 = 16126.07 FEET.
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 868.7
                                                                             EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11156.00 = 13938.96 FEET.
                                                                             Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234; Lca/L=0.6,n=.0218
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                             TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 261.71
  Lca/L=0.3,n=.0297; Lca/L=0.4,n=.0266; Lca/L=0.5,n=.0244; Lca/L=0.6,n=.0228
                                                                            UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1147.05
                                                                            TOTAL AREA(ACRES) = 1013.1 PEAK FLOW RATE(CFS) = 1147.05
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 207.23
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1003.91
 TOTAL AREA (ACRES) = 868.7 PEAK FLOW RATE (CFS) = 1003.91
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           *******************
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.50
                                                                             FLOW PROCESS FROM NODE 11157.00 TO NODE 11158.00 IS CODE = 54
______
 FLOW PROCESS FROM NODE 11156.00 TO NODE 11157.00 IS CODE = 54
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
______
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                           _____
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 1220.00
_____
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 1288.55 CHANNEL SLOPE = 0.0155
 ELEVATION DATA: UPSTREAM(FEET) = 1250.00 DOWNSTREAM(FEET) = 1240.00
                                                                            CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
```

Page 41

Date: 04/21/2014

File name: LR011177.RFS

Date: 04/21/2014 File name: LR0111ZZ.RES Page 42

0.600

0.100

0.100

0.500

0.600

56

56

56

56

32

```
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1147.05
 FLOW VELOCITY (FEET/SEC.) = 21.24 FLOW DEPTH (FEET) = 3.57
 TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 36.80
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11158.00 = 17414.62 FEET.
*******************
 FLOW PROCESS FROM NODE 11158.00 TO NODE 11158.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 36.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.676
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                                   SCS
                                    Fρ
                                             Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                            84.86
                                            0.100
                                                   56
                                    0.75
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 0.58
                                     0.61
                                           1.000
                                                   66
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 3.91
                                     0.75
                                            0.500
                                                  56
 RESIDENTIAL
                    В
                           1.52
 "3-4 DWELLINGS/ACRE"
                                     0.75
                                          0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.131
 SUBAREA AREA(ACRES) = 90.87
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.12;3H= 1.82;6H= 2.47;24H= 4.84
 S-GRAPH: VALLEY(DEV.) = 99.9%; VALLEY(UNDEV.)/DESERT= 0.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.32; Ybar = 0.36
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1104.0
 LONGEST FLOWPATH FROM NODE 11120.00 TO NODE 11158.00 = 17414.62 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0228; Lca/L=0.6,n=.0213
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 296.73
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1246.31
 TOTAL AREA (ACRES) = 1104.0
                           PEAK FLOW RATE (CFS) = 1246.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
______
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 1104.0 TC(MIN.) =
 AREA-AVERAGED Fm(INCH/HR) = 0.32 Ybar = 0.36
 PEAK FLOW RATE (CFS) = 1246.31
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0111ZZ.RES Page 43 Date: 04/21/2014 File name: LR0111ZZ.RES Page 44

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11230 (FILE LR0112ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0112ZZ.DAT

TIME/DATE OF STUDY: 15:10 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGY AND HIDRAULIC MODEL INFORMATION.

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED MINIMOM FIFE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2490

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 9 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 2.00 0.0312 0.167 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 1.5 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11200.00 TO NODE 11201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 934.40 ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1250.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 17.080 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.654 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" В 8.65 0.75 0.500 56 17.08 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500 SUBAREA RUNOFF (CFS) = 17.758.65 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 17 75 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11201.00 TO NODE 11202.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA< \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1250.00 DOWNSTREAM NODE ELEVATION (FEET) = 1247.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 291.59 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700 File name: LR0112ZZ.RES Date: 04/21/2014 Page 2

```
MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.537
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                      B 4.68 0.75 0.100 56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 3.61 0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.274
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.64
 AVERAGE FLOW DEPTH(FEET) = 0.66 FLOOD WIDTH(FEET) = 39.52
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 18.42
 SUBAREA AREA(ACRES) = 8.29
                                SUBAREA RUNOFF (CFS) = 17.40
 EFFECTIVE AREA (ACRES) = 16.94 AREA-AVERAGED Fm (INCH/HR) = 0.29
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA (ACRES) = 16.9 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.70 FLOOD WIDTH (FEET) = 44.30
 FLOW VELOCITY (FEET/SEC.) = 3.81 DEPTH*VELOCITY (FT*FT/SEC) = 2.67
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11202.00 = 1225.99 FEET.
******************
 FLOW PROCESS FROM NODE 11202.00 TO NODE 11203.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
 UPSTREAM NODE ELEVATION (FEET) = 1247.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 419.50
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.426
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      B 12.04
                                      0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.97
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.92
 AVERAGE FLOW DEPTH (FEET) = 0.71 FLOOD WIDTH (FEET) = 45.79
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 19.84
 SUBAREA AREA (ACRES) = 12.04 SUBAREA RUNOFF (CFS) = 25.48
 EFFECTIVE AREA(ACRES) = 28.98 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.27
 TOTAL AREA (ACRES) = 29.0
                                PEAK FLOW RATE(CFS) =
                                                          58.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

```
DEPTH (FEET) = 0.75 FLOOD WIDTH (FEET) = 50.12
 FLOW VELOCITY (FEET/SEC.) = 5.13 DEPTH*VELOCITY (FT*FT/SEC) = 3.85
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11203.00 = 1645.49 FEET.
FLOW PROCESS FROM NODE 11203.00 TO NODE 11204.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1240.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1228.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 824.00
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.252
 SUBAREA LOSS RATE DATA(AMC II):
                                   Fp
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                     В
                            24.00 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.22
 AVERAGE FLOW DEPTH(FEET) = 0.83 FLOOD WIDTH(FEET) = 59.38
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.63 Tc (MIN.) = 22.47
 SUBAREA AREA (ACRES) = 24.00 SUBAREA RUNOFF (CFS) = 47.02
 EFFECTIVE AREA(ACRES) = 52.98 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
 TOTAL AREA(ACRES) = 53.0
                              PEAK FLOW RATE(CFS) =
                                                      100.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.87 FLOOD WIDTH(FEET) = 64.76
 FLOW VELOCITY (FEET/SEC.) = 5.44 DEPTH*VELOCITY (FT*FT/SEC) = 4.76
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11204.00 = 2469.49 FEET.
******************
 FLOW PROCESS FROM NODE 11204.00 TO NODE 11205.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1228.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1217.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 696.50
 "V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.140
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
   LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

END OF SUBAREA "V" GUTTER HYDRAULICS:

Date: 04/21/2014 File name: LR0112ZZ.RES Page 3

```
"3-4 DWELLINGS/ACRE"
                     В
                              1.24
                                         0.75 0.600
               в 18.77
 COMMERCIAL
                                         0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.131
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 118.88
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.83
 AVERAGE FLOW DEPTH(FEET) = 0.90 FLOOD WIDTH(FEET) = 68.19
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.99 Tc (MIN.) = 24.46
 SUBAREA AREA(ACRES) = 20.01
                                SUBAREA RUNOFF (CFS) = 36.77
 EFFECTIVE AREA(ACRES) = 72.99 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.18
 TOTAL AREA (ACRES) = 73.0 PEAK FLOW RATE (CFS) = 131.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.93 FLOOD WIDTH(FEET) = 71.03
 FLOW VELOCITY (FEET/SEC.) = 5.97 DEPTH*VELOCITY (FT*FT/SEC) = 5.55
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11205.00 = 3165.99 FEET.
********************
 FLOW PROCESS FROM NODE 11205.00 TO NODE 11216.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1217.00 DOWNSTREAM ELEVATION(FEET) = 1210.00
 STREET LENGTH (FEET) = 1299.58 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.05
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.00
   HALFSTREET FLOOD WIDTH (FEET) = 55.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.33
 STREET FLOW TRAVEL TIME (MIN.) = 6.54 Tc (MIN.) = 31.01
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.856
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     в 0.81
                                         0.75
                                                0.600
                                                        56
                       В
                               6.99
                                                 0.100
 COMMERCIAL
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.152
```

```
SUBAREA AREA (ACRES) = 7.80 SUBAREA RUNOFF (CFS) = 12.23
 EFFECTIVE AREA(ACRES) = 80.79 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA(ACRES) = 80.8
                             PEAK FLOW RATE (CFS) = 131.93
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 55.29
 FLOW VELOCITY (FEET/SEC.) = 3.27 DEPTH*VELOCITY (FT*FT/SEC.) = 3.25
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11216.00 = 4465.57 FEET.
*******************
 FLOW PROCESS FROM NODE 11216.00 TO NODE 11216.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 31.01
 RAINFALL INTENSITY (INCH/HR) = 1.86
 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.17
 EFFECTIVE STREAM AREA(ACRES) = 80.79
 TOTAL STREAM AREA (ACRES) = 80.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 131.93
******************
 FLOW PROCESS FROM NODE 11210.00 TO NODE 11211.00 IS CODE = 21
_____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 966.99
 ELEVATION DATA: UPSTREAM(FEET) = 1258.00 DOWNSTREAM(FEET) = 1245.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.402
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.940
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                            Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 3.66 0.75 0.500
                                                    56 14.40
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA RUNOFF(CFS) = 8.45
 TOTAL AREA(ACRES) = 3.66 PEAK FLOW RATE(CFS) = 8.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 11211.00 TO NODE 11212.00 IS CODE = 63
```

Date: 04/21/2014 File name: LR0112ZZ.RES

Page 6

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1245.00 DOWNSTREAM ELEVATION(FEET) = 1243.00
 STREET LENGTH (FEET) = 163.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                12.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 14.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.22
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 15.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.821
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               Дp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 0.02 0.98 0.500 32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 4.05 0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA (ACRES) = 4.07 SUBAREA RUNOFF (CFS) = 8.96
 EFFECTIVE AREA(ACRES) = 7.73 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 7.7 PEAK FLOW RATE (CFS) = 17.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 16.78
 FLOW VELOCITY (FEET/SEC.) = 2.83 DEPTH*VELOCITY (FT*FT/SEC.) = 1.40
 LONGEST FLOWPATH FROM NODE 11210.00 TO NODE 11212.00 = 1130.49 FEET.
*****************
 FLOW PROCESS FROM NODE 11212.00 TO NODE 11213.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1243.00 DOWNSTREAM ELEVATION(FEET) = 1238.00
 STREET LENGTH (FEET) = 291.09 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
```

```
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.12
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.62
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.96
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 16.77
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.684
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.00
                                        0.98
                                                0.500
                                                       32
 AGRICULTURAL FAIR COVER
                               2.32
                                        0.88
                                               1.000
 "ORCHARDS"
                      A
                                                       44
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                               2.10
                                        0.75
                                                0.500
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.19
                                        0.98
                                                0.600
                                                       32
                               0.25
                                        0.98
                                                0.100
 COMMERCIAL
                                                0.100 56
 COMMERCIAL
                        В
                               4.52
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.430
 SUBAREA AREA (ACRES) = 10.38 SUBAREA RUNOFF (CFS) = 21.67
 EFFECTIVE AREA(ACRES) = 18.11 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.80 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 18.1 PEAK FLOW RATE (CFS) = 37.73
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.54
 FLOW VELOCITY (FEET/SEC.) = 3.91 DEPTH*VELOCITY (FT*FT/SEC.) = 2.30
 LONGEST FLOWPATH FROM NODE 11210.00 TO NODE 11213.00 = 1421.58 FEET.
*******************
 FLOW PROCESS FROM NODE 11213.00 TO NODE 11214.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1238.00 DOWNSTREAM ELEVATION(FEET) = 1231.00
 STREET LENGTH (FEET) = 426.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0112ZZ.RES

Page 8

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.05 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH (FEET) = 25.47 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.25 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.83 STREET FLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 18.44 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.535 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Аp SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE A 4.75 0.98 0.100 32 COMMERCIAL AGRICULTURAL POOR COVER "LEGUMES, CLOSE SEEDED" A 6.63 0.61 1.000 66 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.56 0.98 0.600 32 В COMMERCIAL 6.74 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.434 SUBAREA AREA(ACRES) = 18.68 SUBAREA RUNOFF(CFS) = 37.79 EFFECTIVE AREA(ACRES) = 36.79 AREA-AVERAGED Fm(INCH/HR) = 0.33 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.45 TOTAL AREA (ACRES) = 36.8 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 30.62 FLOW VELOCITY (FEET/SEC.) = 4.51 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.24 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS. AND L = 426.5 FT WITH ELEVATION-DROP = 7.0 FT, IS 66.6 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11214.00 LONGEST FLOWPATH FROM NODE 11210.00 TO NODE 11214.00 = 1848.08 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11214.00 TO NODE 11215.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 14 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1231.00 DOWNSTREAM ELEVATION(FEET) = 1218.00 STREET LENGTH (FEET) = 803.00 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.05
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 39.69
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.89
 STREET FLOW TRAVEL TIME (MIN.) = 2.79 Tc (MIN.) = 21.23
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      A 24.86 0.98 0.100
 COMMERCIAL
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                       A 1.07 0.88 1.000
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.93 0.98 0.600 COMMERCIAL B 8.86 0.75 0.100
                                         0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.91
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.140
 SUBAREA AREA (ACRES) = 35.72 SUBAREA RUNOFF (CFS) = 70.79
 EFFECTIVE AREA(ACRES) = 72.51 AREA-AVERAGED Fm(INCH/HR) = 0.23
 AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.30
 TOTAL AREA (ACRES) = 72.5 PEAK FLOW RATE (CFS) = 137.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 45.31
 FLOW VELOCITY (FEET/SEC.) = 5.01 DEPTH*VELOCITY (FT*FT/SEC.) = 4.33
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 803.0 FT WITH ELEVATION-DROP = 13.0 FT, IS 113.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11215.00
 LONGEST FLOWPATH FROM NODE 11210.00 TO NODE 11215.00 = 2651.08 FEET.
********************
 FLOW PROCESS FROM NODE 11215.00 TO NODE 11216.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1218.00 DOWNSTREAM ELEVATION(FEET) = 1210.00
 STREET LENGTH (FEET) = 711.04 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
```

File name: LR0112ZZ.RES

Page 10

Date: 04/21/2014

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 153.90
   ***STREET FLOWING FULL***
                                                                                RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                CONFLUENCE FORMULA USED FOR 2 STREAMS.
   STREET FLOW DEPTH(FEET) = 0.94
                                                                                ** PEAK FLOW RATE TABLE **
   HALFSTREET FLOOD WIDTH (FEET) = 52.79
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.41
                                                                                STREAM
                                                                                        Q Tc Intensity Fp(Fm)
                                                                                                                       Ap Ae
                                                                                                                                     HEADWATER
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.15
                                                                                NUMBER
                                                                                          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                              (ACRES) NODE
 STREET FLOW TRAVEL TIME (MIN.) = 2.69 Tc (MIN.) = 23.92
                                                                                 1
                                                                                         280.41 23.92 2.169 0.77(0.17) 0.23 153.0 11210.00
                                                                                         266.60 31.01 1.856 0.77(0.17) 0.22 171.5 11200.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.169
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                PEAK FLOW RATE (CFS) = 280.41 Tc (MIN.) = 23.92
                                                                                EFFECTIVE AREA(ACRES) = 153.01 AREA-AVERAGED Fm(INCH/HR) = 0.17
 COMMERCIAL
                      A
                              10.02
                                       0.98
                                                0.100 32
                      В
 COMMERCIAL
                              7.05
                                        0.75
                                                0.100
                                                     56
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.23
                                                                                TOTAL AREA (ACRES) = 171.5
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.51
                                        0.98
                                                0.600
                                                      32
                                                                                LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11216.00 = 4465.57 FEET.
 RESIDENTIAL
                                                                              *******************
 "3-4 DWELLINGS/ACRE"
                    В 0.60
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
                                                                                FLOW PROCESS FROM NODE 11216.00 TO NODE 11228.00 IS CODE = 63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.131
 SUBAREA AREA (ACRES) = 18.18 SUBAREA RUNOFF (CFS) = 33.62
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 EFFECTIVE AREA(ACRES) = 90.69 AREA-AVERAGED Fm(INCH/HR) = 0.21
                                                                               >>>> (STREET TABLE SECTION # 12 USED) <<<<
 AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.26
                                                                              ______
 TOTAL AREA(ACRES) = 90.7 PEAK FLOW RATE(CFS) =
                                                                                UPSTREAM ELEVATION(FEET) = 1210.00 DOWNSTREAM ELEVATION(FEET) = 1209.00
                                                                                STREET LENGTH (FEET) = 1455.69 CURB HEIGHT (INCHES) = 8.0
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                STREET HALFWIDTH (FEET) = 24.00
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DEPTH(FEET) = 0.95 HALFSTREET FLOOD WIDTH(FEET) = 53.22
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 FLOW VELOCITY (FEET/SEC.) = 4.47 DEPTH*VELOCITY (FT*FT/SEC.) = 4.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
       AND L = 711.0 FT WITH ELEVATION-DROP = 8.0 FT, IS 56.9 CFS,
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11216.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 LONGEST FLOWPATH FROM NODE 11210.00 TO NODE 11216.00 = 3362.12 FEET.
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
FLOW PROCESS FROM NODE 11216.00 TO NODE 11216.00 IS CODE = 1
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
_____
                                                                                 ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                 STREET FLOW DEPTH(FEET) = 1.84
______
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 82.91
 TOTAL NUMBER OF STREAMS = 2
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.05
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.78
 TIME OF CONCENTRATION (MIN.) = 23.92
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 11.85 Tc (MIN.) = 35.77
 RAINFALL INTENSITY (INCH/HR) = 2.17
                                                                                * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.704
 AREA-AVERAGED Fm(INCH/HR) = 0.21
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp (INCH/HR) = 0.78
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
                                                                                                                               Αр
 AREA-AVERAGED Ap = 0.26
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 EFFECTIVE STREAM AREA(ACRES) = 90.69
                                                                                RESIDENTIAL
 TOTAL STREAM AREA(ACRES) = 90.69
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                    B 1.02
                                                                                                                       0.75
                                                                                                                              0.600
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 160.21
                                                                                COMMERCIAL
                                                                                                    B 1.91
                                                                                                                       0.75
                                                                                                                              0.100
                                                                                                                                      56
                                                                                                           3.22
                                                                                                    A
                                                                                                                       0.98
                                                                                                                              0.100
                                                                                                                                      32
                                                                                COMMERCIAL
 ** CONFLUENCE DATA **
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                    A 0.57
                                                                                                                       0.98 0.600
  STREAM
         O Tc Intensity Fp(Fm)
                                          Ap Ae
                                                      HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
    1 131.93 31.01 1.856 0.75(0.13)0.17 80.8 11200.00
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.218
```

Page 11

Date: 04/21/2014

File name: LR0112ZZ.RES

Page 12

Date: 04/21/2014 File name: LR0112ZZ.RES

2 160.21 23.92 2.169 0.78(0.21) 0.26 90.7 11210.00

```
SUBAREA AREA (ACRES) = 6.72 SUBAREA RUNOFF (CFS) = 9.18
 EFFECTIVE AREA(ACRES) = 159.73 AREA-AVERAGED Fm(INCH/HR) = 0.18
 AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.23
 TOTAL AREA (ACRES) = 178.2 PEAK FLOW RATE (CFS) = 280.41
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.83 HALFSTREET FLOOD WIDTH(FEET) = 82.36
 FLOW VELOCITY (FEET/SEC.) = 2.04 DEPTH*VELOCITY (FT*FT/SEC.) = 3.74
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.16
 PIPE-FLOW(CFS) = 238.08
 PIPEFLOW TRAVEL TIME (MIN.) = 2.65 Tc (MIN.) = 26.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.036
 SUBAREA AREA (ACRES) = 6.72 SUBAREA RUNOFF (CFS) = 11.19
 TOTAL AREA (ACRES) = 178.2 PEAK FLOW RATE (CFS) = 280.41
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 42.33
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.96
   HALFSTREET FLOOD WIDTH (FEET) = 38.72
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11228.00 = 5921.26 FEET.
*********************
 FLOW PROCESS FROM NODE 11228.00 TO NODE 11228.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.56
 RAINFALL INTENSITY (INCH/HR) = 2.04
 AREA-AVERAGED Fm(INCH/HR) = 0.18
 AREA-AVERAGED Fp(INCH/HR) = 0.78
 AREA-AVERAGED Ap = 0.23
 EFFECTIVE STREAM AREA(ACRES) = 159.73
 TOTAL STREAM AREA(ACRES) = 178.20
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 280.41
*****************
 FLOW PROCESS FROM NODE 11220.00 TO NODE 11221.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 457.70
 ELEVATION DATA: UPSTREAM(FEET) = 1250.00 DOWNSTREAM(FEET) = 1243.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.132
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.143
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                               Ap
                                                      SCS Tc
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               2.72
                                       0.88
                                               1.000
                                                       44 18.89
                        Α
 COMMERCIAL
                        В
                             1.97
                                       0.75
                                               0.100
                                                       56 8.13
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                        В 1.96
                                       0.75
                                               0.500
                                                      56 10.41
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      A 0.87
                                        0.98
                                               0.500
                                                      32 10.41
                                                      32 8.13
 COMMERCIAL
                        A 0.41
                                       0.98
                                               0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       в 0.38
                                       0.75
                                               0.600
                                                      56 11.02
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.554
 SUBAREA RUNOFF (CFS) = 27.47
 TOTAL AREA (ACRES) = 8.31 PEAK FLOW RATE (CFS) = 27.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 11221.00 TO NODE 11222.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1243.00 DOWNSTREAM ELEVATION(FEET) = 1241.00
 STREET LENGTH (FEET) = 170.65 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  32.45
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.76
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.93
 STREET FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 8.95
       Date: 04/21/2014
                      File name: LR0112ZZ.RES
                                                     Page 14
```

```
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.911
                                                                                  COMMERCIAL
                                                                                                          B 0.02 0.75 0.100
                                                                                                                                          56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" A 0.19 0.98 0.600 32
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 COMMERCIAL
                      В
                                0.04
                                      0.75
                                                 0.100 56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.125
                                1.72
                                                       32
 COMMERCIAL
                       A
                                         0.98
                                                 0.100
                                                                                  SUBAREA AREA (ACRES) = 3.83 SUBAREA RUNOFF (CFS) = 12.29
                                                                                  EFFECTIVE AREA(ACRES) = 15.32 AREA-AVERAGED Fm(INCH/HR) = 0.38
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.16
                                                 0.600 32
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.43
                                         0.98
                                                                                  TOTAL AREA (ACRES) = 15.3 PEAK FLOW RATE (CFS) = 45.65
 AGRICULTURAL FAIR COVER
                              1.26 0.88 1.000 44
 "ORCHARDS"
                       A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA(ACRES) = 3.18
                               SUBAREA RUNOFF(CFS) = 9.96
 EFFECTIVE AREA(ACRES) = 11.49 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.53
                                                                                  DEPTH (FEET) = 0.62 HALFSTREET FLOOD WIDTH (FEET) = 24.24
 TOTAL AREA(ACRES) = 11.5 PEAK FLOW RATE(CFS) =
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.66 DEPTH*VELOCITY (FT*FT/SEC.) = 2.28
                                                          35.69
                                                                                  LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11223.00 = 827.35 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 ******************
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   FLOW PROCESS FROM NODE 11223.00 TO NODE 11224.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.49
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 FLOW VELOCITY (FEET/SEC.) = 3.58 DEPTH*VELOCITY (FT*FT/SEC.) = 2.04
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11222.00 = 628.35 FEET.
                                                                                 ______
                                                                                  UPSTREAM ELEVATION(FEET) = 1239.00 DOWNSTREAM ELEVATION(FEET) = 1235.00
*******************
                                                                                  STREET LENGTH (FEET) = 319.58 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 11222.00 TO NODE 11223.00 IS CODE = 63
                                                                                  STREET HALFWIDTH (FEET) = 18.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1241.00 DOWNSTREAM ELEVATION(FEET) = 1239.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 199.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     54.41
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH(FEET) = 0.64
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 24.85
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.16
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.65
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.84
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 11.16
   ***STREET FLOWING FULL***
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.426
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA Fp
   STREET FLOW DEPTH (FEET) = 0.61
                                                                                                                                 αA
                                                                                                                                         SCS
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   HALFSTREET FLOOD WIDTH (FEET) = 23.44
                                                                                  COMMERCIAL
                                                                                                       B 0.50 0.75 0.100
A 5.09 0.98 0.100
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.17
                                                                                  COMMERCIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) =
                                                                                  RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.686
                                                                                  "3-4 DWELLINGS/ACRE" A
                                                                                                               0.30 0.98 0.600
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.125
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA (ACRES) = 5.89 SUBAREA RUNOFF (CFS) = 17.52
                                                                                  EFFECTIVE AREA(ACRES) = 21.21 AREA-AVERAGED Fm(INCH/HR) = 0.30
 COMMERCIAL
                      A
                                3.62 0.98
                                                 0.100 32
```

Date: 04/21/2014 File name: LR0112ZZ.RES Page 15

File name: LR0112ZZ.RES

Page 16

Date: 04/21/2014

```
AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.35
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 TOTAL AREA (ACRES) =
                    21.2
                               PEAK FLOW RATE (CFS) =
                                                          59.59
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.86
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.86 DEPTH*VELOCITY (FT*FT/SEC.) = 3.29
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                        AND L = 327.1 FT WITH ELEVATION-DROP = 5.0 FT, IS 25.1 CFS,
 DEPTH (FEET) = 0.65 HALFSTREET FLOOD WIDTH (FEET) = 25.70
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11225.00
                                                                                  LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11225.00 = 1474.01 FEET.
 FLOW VELOCITY (FEET/SEC.) = 4.27 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                ******************
       AND L = 319.6 FT WITH ELEVATION-DROP = 4.0 FT, IS 22.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11224.00
                                                                                  FLOW PROCESS FROM NODE 11225.00 TO NODE 11226.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11224.00 = 1146.93 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 11224.00 TO NODE 11225.00 IS CODE = 63
                                                                                ______
______
                                                                                  UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1222.00
                                                                                  STREET LENGTH(FEET) = 398.06 CURB HEIGHT(INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1235.00 DOWNSTREAM ELEVATION(FEET) = 1230.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 327.08 CURB HEIGHT (INCHES) = 6.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH(FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    68.52
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 26.74
   ***STREET FLOWING FULL***
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.56
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.75
   STREET FLOW DEPTH(FEET) = 0.66
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 13.50
   HALFSTREET FLOOD WIDTH (FEET) = 26.07
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.057
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.78
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.16
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                   αA
 STREET FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 12.30
                                                                                      LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.232
                                                                                                       B 3.44 0.75
                                                                                                                                 0.100
                                                                                  COMMERCIAL
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" A 0.04
                                                                                                                          0.98
                                                                                                                                  0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                        SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       в 0.34
 COMMERCIAL
                      B 1.45 0.75
                                                 0.100 56
                                                                                                                          0.75
                                                                                                                                  0.600
                       A
                              4.60
                                        0.98
                                                 0.100 32
                                                                                                               3.54
                                                                                                                          0.98
                                                                                                                                  0.100
 COMMERCIAL
                                                                                  COMMERCIAL
                                                                                                         A
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.126
 "3-4 DWELLINGS/ACRE"
                      A 0.32
                                       0.98
                                                 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
                                                                                  SUBAREA AREA (ACRES) = 7.36 SUBAREA RUNOFF (CFS) = 19.55
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.125
                                                                                  EFFECTIVE AREA(ACRES) = 34.94 AREA-AVERAGED Fm(INCH/HR) = 0.23
 SUBAREA AREA (ACRES) = 6.37 SUBAREA RUNOFF (CFS) = 17.86
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.26
 EFFECTIVE AREA(ACRES) = 27.58 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                                  TOTAL AREA (ACRES) = 34.9 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Fp (INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.30
 TOTAL AREA (ACRES) = 27.6 PEAK FLOW RATE (CFS) =
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

83.52

56

32

56

88.96

Date: 04/21/2014 File name: LR0112ZZ.RES Page 17 Date: 04/21/2014 File name: LR0112ZZ.RES Page 18

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.35
 FLOW VELOCITY (FEET/SEC.) = 5.67 DEPTH*VELOCITY (FT*FT/SEC.) = 3.89
 LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11226.00 = 1872.07 FEET.
FLOW PROCESS FROM NODE 11226.00 TO NODE 11227.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1222.00 DOWNSTREAM ELEVATION(FEET) = 1215.00
 STREET LENGTH (FEET) = 348.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 97.48
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.39
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.79
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.09
 STREET FLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 14.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.928
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                             αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                     B 5.47
                                      0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.35
                                      0.75
                                              0.600 56
                     A
                             0.87
                                       0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.126
 SUBAREA AREA(ACRES) = 6.69 SUBAREA RUNOFF(CFS) = 17.05
 EFFECTIVE AREA(ACRES) = 41.63 AREA-AVERAGED Fm(INCH/HR) = 0.21
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.24
 TOTAL AREA(ACRES) = 41.6 PEAK FLOW RATE(CFS) =
                                                   101.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.88
 FLOW VELOCITY (FEET/SEC.) = 5.86 DEPTH*VELOCITY (FT*FT/SEC.) = 4.20
 LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11227.00 = 2220.57 FEET.
FLOW PROCESS FROM NODE 11227.00 TO NODE 11228.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1215.00 DOWNSTREAM ELEVATION(FEET) = 1209.00
 STREET LENGTH (FEET) = 284.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.03
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.36
 STREET FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 15.28
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.837
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.59 0.75 0.600
 COMMERCIAL B 3.33 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.175
 SUBAREA AREA (ACRES) = 3.92 SUBAREA RUNOFF (CFS) = 9.55
 EFFECTIVE AREA (ACRES) = 45.55 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.23
 TOTAL AREA (ACRES) = 45.5 PEAK FLOW RATE (CFS) = 108.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.72 HALFSTREET FLOOD WIDTH (FEET) = 29.24
 FLOW VELOCITY (FEET/SEC.) = 6.06 DEPTH*VELOCITY (FT*FT/SEC.) = 4.39
 LONGEST FLOWPATH FROM NODE 11220.00 TO NODE 11228.00 = 2504.57 FEET.
FLOW PROCESS FROM NODE 11228.00 TO NODE 11228.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.28
 RAINFALL INTENSITY (INCH/HR) = 2.84
```

File name: LR0112ZZ.RES

Page 20

Date: 04/21/2014

AREA-AVERAGED Fm(INCH/HR) = 0.20AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.23EFFECTIVE STREAM AREA(ACRES) = 45.55 TOTAL STREAM AREA(ACRES) = 45.55 PEAK FLOW RATE (CFS) AT CONFLUENCE = 108.09 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER 1 280.41 26.56 2.036 0.78(0.18) 0.23 159.7 11210.00 1 266.60 33.73 1.764 0.77(0.17) 0.22 178.2 11200.00 108.09 15.28 2.837 0.86(0.20)0.23 45.5 11220.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* STREAM O To Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 338.85 15.28 2.837 0.81(0.18) 0.23 137.5 11220.00 355.67 26.56 2.036 0.80(0.18) 0.23 205.3 11210.00 330.71 33.73 1.764 0.79(0.18) 0.22 223.8 11200.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 355.67 Tc (MIN.) = 26.56 EFFECTIVE AREA(ACRES) = 205.28 AREA-AVERAGED Fm(INCH/HR) = 0.18 AREA-AVERAGED Fp(INCH/HR) = 0.80 AREA-AVERAGED Ap = 0.23 TOTAL AREA(ACRES) = 223.8 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11228.00 = 5921.26 FEET. \*\*\*\*\* FLOW PROCESS FROM NODE 11228.00 TO NODE 11229.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 14 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION (FEET) = 1209.00 DOWNSTREAM ELEVATION (FEET) = 1208.00 STREET LENGTH (FEET) = 1471.75 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07

AXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 402.56

\*\*\*STREET FLOWING FULL\*\*\*

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH(FEET) = 1.93

HALFSTREET FLOOD WIDTH(FEET) = 102.41

AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.13

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.12

STREET FLOW TRAVEL TIME (MIN.) = 11.51 Tc (MIN.) = 38.08 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.641 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" B 4.31 0.75 0.500 COMMERCIAL B 62.16 0.75 56 0.100 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.96 0.75 0.600 COMMERCIAL A 0.07 0.98 0.100 32 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.133 SUBAREA AREA (ACRES) = 67.50 SUBAREA RUNOFF (CFS) = 93.65 EFFECTIVE AREA(ACRES) = 272.78 AREA-AVERAGED Fm(INCH/HR) = 0.16 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.20TOTAL AREA (ACRES) = 291.2 PEAK FLOW RATE (CFS) = 363.33 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 1.87 HALFSTREET FLOOD WIDTH(FEET) = 98.99 FLOW VELOCITY (FEET/SEC.) = 2.07 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.87 \*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 81.0 INCH PIPE IS 65.0 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 11.56 PIPE-FLOW(CFS) = 355.67PIPEFLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 28.69 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.945 SUBAREA AREA (ACRES) = 67.50 SUBAREA RUNOFF (CFS) = 112.11 TOTAL AREA(ACRES) = 291.2 PEAK FLOW RATE(CFS) = 437.95 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 \*NOTE: STREET-CAPACITY MAY BE EXCEEDED\* STREETFLOW HYDRAULICS BASED ON MAINLINE Tc : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 82.28 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 1.16HALFSTREET FLOOD WIDTH (FEET) = 63.47 AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.38 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.59 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 1471.8 FT WITH ELEVATION-DROP = 1.0 FT, IS 124.8 CFS, WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11229.00 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 455.22 17.41 2.624 0.79(0.16) 0.20 205.0 11220.00 437.95 28.69 1.945 0.79(0.16) 0.20 272.8 11210.00

```
404.17 35.87 1.701 0.79(0.16) 0.20 291.2 11200.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 455.22 Tc (MIN.) = 17.41
 AREA-AVERAGED Fm(INCH/HR) = 0.16 AREA-AVERAGED Fp(INCH/HR) = 0.79
 AREA-AVERAGED Ap = 0.20 EFFECTIVE AREA(ACRES) = 204.95
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11229.00 = 7393.01 FEET.
*****************
 FLOW PROCESS FROM NODE 11229.00 TO NODE 11230.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1208.00 DOWNSTREAM ELEVATION(FEET) = 1200.00
 STREET LENGTH (FEET) = 1206.48 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 545.74
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.46
   HALFSTREET FLOOD WIDTH (FEET) = 78.43
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.34
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.77
 STREET FLOW TRAVEL TIME (MIN.) = 3.77 Tc (MIN.) = 21.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.333
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 8.11
                                         0.75
                                                 0.500 56
                                         0.75
                      в 80.91
                                                 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В 1.30
                                       0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.143
 SUBAREA AREA(ACRES) = 90.32 SUBAREA RUNOFF(CFS) = 180.95
 EFFECTIVE AREA(ACRES) = 295.27 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.24
 TOTAL AREA (ACRES) = 381.6 PEAK FLOW RATE (CFS) = 569.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.48 HALFSTREET FLOOD WIDTH(FEET) = 79.46
 FLOW VELOCITY (FEET/SEC.) = 5.40 DEPTH*VELOCITY (FT*FT/SEC.) = 7.97
```

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 25.06
 PIPE-FLOW(CFS) = 444.37
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 18.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.554
 SUBAREA AREA (ACRES) = 90.32 SUBAREA RUNOFF (CFS) = 198.90
 TOTAL AREA(ACRES) = 381.6 PEAK FLOW RATE(CFS) = 628.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 183.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.05
   HALFSTREET FLOOD WIDTH (FEET) = 58.34
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.89
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.10
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
     AND L = 1206.5 FT WITH ELEVATION-DROP = 8.0 FT, IS 232.7 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11230.00
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                     HEADWATER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
  NUMBER
                                              (ACRES) NODE
   1
          643.84 18.10 2.564 0.78(0.14) 0.18 295.3 11220.00
          576.52 29.52 1.912 0.78 (0.15) 0.19 363.1 11210.00
          525.74 36.70 1.677 0.78(0.15) 0.19 381.6 11200.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 643.84 Tc (MIN.) = 18.10
 AREA-AVERAGED Fm (INCH/HR) = 0.14 AREA-AVERAGED Fp (INCH/HR) = 0.78
 AREA-AVERAGED Ap = 0.18 EFFECTIVE AREA(ACRES) = 295.27
 LONGEST FLOWPATH FROM NODE 11200.00 TO NODE 11230.00 = 8599.49 FEET.
______
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 381.6 TC(MIN.) = 18.10
 EFFECTIVE AREA (ACRES) = 295.27 AREA-AVERAGED Fm (INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.243
 PEAK FLOW RATE (CFS) = 643.84
 ** PEAK FLOW RATE TABLE **
  STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 NUMBER
  1
          643.84 18.10 2.564 0.78(0.14)0.18 295.3 11220.00
   2 576.52 29.52 1.912 0.78(0.15) 0.19 363.1 11210.00
          525.74 36.70 1.677 0.78 (0.15) 0.19 381.6 11200.00
______
_____
 END OF RATIONAL METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0112ZZ.RES Page 23 Date: 04/21/2014 File name: LR0112ZZ.RES Page 24

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11317 (FILE LR0113ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0113ZZ.DAT

TIME/DATE OF STUDY: 15:46 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) ===== ====== 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17	20.0	10.0	0.020/0.	020/0.020	0.50	1.50	0.0312 0	.125	0.0180
18	26.0	15.0	0.020/0.	020/0.020	0.67	2.00	0.0312 0	.167	0.0180
19	52.0	20.0	0.020/0.	020/0.020	0.67	2.00	0.0312 0	.167	0.0180
*S	1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T	ve Flow- ximum Al 1)*(Veloc WITH A F O THE UP	DEPTH CONS Depth = 0 lowable St city) Const COW CAPACI ESTREAM TRI HIMUM TOPOG	.20 FEET reet Flow raint = 6 TY GREATER BUTARY PIP	.0 (FT*F THAN E.*	T/S)		TED	
	WATERSHED USED "VAL 1 UNITS/A FOR DEVEL PRECIPITA SIERRA MA	LAG = 0 LEY UNDE CRE AND OPMENTS TION DAT	DEL SELECTI 1.80 * TC EVELOPED" S LESS; AND OF 2 UNITS CA ENTERED "H-AREA FAC CONDITION	-GRAPH FOR "VALLEY DE /ACRE AND ON SUBAREA TORS USED.	DEVELOP VELOPED" MORE. BASIS.	S-GRA	PH	RAPH I	METHOD
***	*****	*****	*****	*****	*****	*****	*****	****	*****
			IODE 11302						
>>	>>>RATTON								
>>				SUBAREA AN. Omograph f			ARFA<<		
IN	USE TIME- ======= ITIAL SUB	OF-CONCE  BAREA FLC	NTRATION N  W-LENGTH(F	OMOGRAPH F ======= EET) = 8	OR INITI  62.73	AL SUB	======		
IN EL Tc SU	USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 100 YEAR	OF-CONCE	ENTRATION N ENTRATION N ENTRAMINE ENTREAM (FEET ENTRAMINE ENTREAM (FEEV ENTRAMINE ENTR	OMOGRAPH F ====================================	DR INITI ======= 62.73 .00 DOW GE)]**0. = 15.2 = 2.840	AL SUBA =====: NSTREAL 20 82	======		
IN EL Tc SU *	USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 100 YEAR BAREA TC	OF-CONCE AREA FLC ATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS	ENTRATION N W-LENGTH(F TREAM(FEET	OMOGRAPH F ====================================	DR INITI ==================================	AL SUBA =====: NSTREAL 20 82	======= M(FEET) =	12	05.00
IN EL Tc SU *	USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 100 YEAR BAREA TC	OF-CONCE AREA FLC ATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS	ENTRATION N W-LENGTH(F TREAM(FEET	OMOGRAPH F ====================================	DR INITI ==================================	AL SUBA =====: NSTREAL 20 82	======= M(FEET) =	12	05.00
IN EL Tc SU * SU D	USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 100 YEAR BAREA TC	OF-CONCE	ENTRATION N	OMOGRAPH F ====================================	DR INITI ======= 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp (INCH	AL SUB: =====: NSTREAL 20 82 /HR)	Ap (DECIMAL)	12 SCS CN	05.00 Tc (MIN.
IN EL TC SU * SU CO RE	USE TIME- ====================================	OF-CONCE	CONTRATION N CONTRACTOR NO CON	OMOGRAPH F ====================================	DR INITI 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp (INCH 3 0	AL SUBA	Ap (DECIMAL) 0.100	12 SCS CN 56	Tc (MIN. 15.2
IN EL TC SU * SU CO RE	USE TIME- ====================================	OF-CONCE	CONTRATION N CONTRACTION N CONTRACTOR CONTRA	OMOGRAPH F ======== EET) = 8 ) = 1207 ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3	DR INITI 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp (INCH B 0	AL SUB: ======: NSTREAM 20 82  /HR) .75	Ap (DECIMAL) 0.100 0.600	12 SCS CN 56	Tc (MIN. 15.2
IN ELL TC SU * SU D CO RE "33 CO	USE TIME- ====================================	OF-CONCE	CONTRATION N CONTRACTION N CONTRACTOR CONTRA	OMOGRAPH F ====================================	DR INITI 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp (INCH B 0	AL SUB: ======: NSTREAM 20 82  /HR) .75	Ap (DECIMAL) 0.100 0.600	12 SCS CN 56	Tc (MIN. 15.2
IN ELL  TC SU * SU D  CO RE "33 CO RE	USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI MMERCIAL SIDENTIAL SIDENTIAL	OF-CONCE	CONTRATION N CONTRATION N CONTRACTOR CONTRAC	OMOGRAPH F ========  EET) = 8 ) = 1207  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3  1.6 1.2	DR INITI ======= 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp ) (INCH B 0 0 0	AL SUB:	Ap (DECIMAL) 0.100 0.600 0.100	12 SCS CN 56 56 32	Tc (MIN. 15.2 20.7 15.2
IN EL TC SU * SU D CO RE "3 CO RE "3 SU SU SU SU	USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI MMERCIAL SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE	OF-CONCE	CONTRATION N CONTR	OMOGRAPH F =======  EET) = 8 ) = 1207  ATION CHAN TC (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3  1.6 1.2  0.5  RATE, Fp( FRACTION,	DR INITI ======= 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp ) (INCH B 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AL SUB: ====================================	Ap (DECIMAL) 0.100 0.600 0.100 0.600	12 SCS CN 56 56 32	Tc (MIN. 15.2 20.7 15.2
IN EL TC SU * SU D CO RE "3 CO RE "3 SU SU SU SU SU SU SU	USE TIME- ======= ITIAL SUE EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI MMERCIAL SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE	OF-CONCE	CONTRATION N CONTR	OMOGRAPH F =======  EET) = 8 ) = 1207  ATION CHAN    Tc (MIN.)    (INCH/HR)    (AMC II): OIL AREA P (ACRES	DR INITI ======== 62.73 .00 DOW GE)]**0. = 15.2 = 2.840	AL SUB: ====================================	Ap (DECIMAL) 0.100 0.600 0.100 0.600 80	12 SCS CN 56 56 32	Tc (MIN. 15.2 20.7 15.2
IN ELL TC SU * SU D CO RE "3 CO RE "3 SU SU SU TO	USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI MMERCIAL SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA RUN TAL AREA(	OF-CONCE	ENTRATION N ENTRATE DATA SCS S GROU B ENTRATION N ENTR	OMOGRAPH F ======= EET) = 8 ) = 1207 ATION CHAN TC (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3 1.6 1.2 0.5 RATE, Fp( FRACTION, 58 PEAK FL	DR INITI ======= 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp ) (INCH B 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	AL SUB: ====================================	Ap (DECIMAL) 0.100 0.600 0.100 0.600 80	12 SCS CN 56 56 32	Tc (MIN. 15.2 20.7 15.2
IN ELL TC SU * SU D CO RE "33 CO RE "33 SU SU SU TO SU	USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA RUN TAL AREA( BAREA ARE	OF-CONCE	ENTRATION N ENTRATE DATA SCS S GROU B EN	OMOGRAPH F ======= EET) = 8 ) = 1207 ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3  1.6 1.2  0.5 RATE, Fp( FRACTION, 58 PEAK FL	DR INITI ======== 62.73 .00 DOW GE)]**0. = 15.2 = 2.840 Fp (INCH B 0 0 0 0 0 INCH/HR) Ap = 0 DW RATE( CH):	AL SUB: ====================================	Ap (DECIMAL) 0.100 0.600 0.100 0.600 80	SCS CN 56 56 32 32	Tc (MIN. 15.2 20.7 15.2 20.7
IN ELL TC SU * SU D CO RE "3 CO RE SU SU SU SU SU SU SM ****	USE TIME- ======== ITIAL SUB EVATION D  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U MMERCIAL SIDENTIAL -4 DWELLI MMERCIAL SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.31;  ************ OW PROCES	OF-CONCE BAREA FLC BAREA FLC BATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ ISE CNGS/ACRE CRAGE PER GRAGE	ENTRATION N ENTRATE DATA SCS S GROU B ENTRATE DATA A ENTRATE DATA B	OMOGRAPH F ======== EET) = 8 ) = 1207  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3  1.6 1.2  0.5 RATE, Fp( FRACTION, 58 PEAK FL L DEPTH(IN 0.85; 3HR  ***********************************	DR INITI 62.73 .00 DOW GE)]**0	AL SUB: ====================================	Ap (DECIMAL) 0.100 0.600 0.100 0.600 80 23.5	SCS CN 56 56 32 32 8 R = 3	TC (MIN. 15.2 20.7 15.2 20.7
IN ELL TC SU * SU D CO RE "3 CO RE "3 SU SU SU TO SU 5M ***	USE TIME- ====================================	OF-CONCE BAREA FLC BAREA FLC BATA: UPS BAILYSIS US RAINFALL AND LOSS BT TYPE/ ISE BASS/ACRE BASS	ENTRATION N ENTRATE DATA SCS S GROU B ENTRATE DATA A ENTRATE DATA B	OMOGRAPH F ======== EET) = 8 ) = 1207  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 6.3  1.6 1.2  0.5 RATE, Fp( FRACTION, 58 PEAK FL L DEPTH(IN 0.85; 3HR  ***********************************	DR INITI 02.73 .00 DOW GE)]**0 15.2 15.2 15.2 15.2 15.2 15.2 15.2 15.2 15.2 15.2 15.2  Fp (INCH B 0 0 0 0 INCH/HR) Ap = 0  DW RATE( CH): 11.39;	AL SUB:	Ap (DECIMAL) 0.100 0.600 0.100 0.600 80 23.5	SCS CN 56 56 32 32 8 R = 3	TC (MIN. 15.2 20.7 15.2 20.7

Date: 04/21/2014 File name: LR0113ZZ.RES File name: LR0113ZZ.RES Page 1 Date: 04/21/2014 Page 2

```
STREET LENGTH (FEET) = 394.00 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.79
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.65
 HALFSTREET FLOOD WIDTH (FEET) = 25.52
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.33
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.16
STREET FLOW TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 17.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.640
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                  Aρ
                                                          SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      В 16.73
                                         0.75
                                                  0.100 56
COMMERCIAL
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.71 0.75
                                                  0.600 56
                               1.91
                                                  0.100 32
COMMERCIAL
                      A
                                          0.98
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118
SUBAREA AREA (ACRES) = 19.35 SUBAREA RUNOFF (CFS) = 44.40
EFFECTIVE AREA(ACRES) = 29.16 AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.15
TOTAL AREA (ACRES) = 29.2 PEAK FLOW RATE (CFS) =
                                                            66.22
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.49
FLOW VELOCITY (FEET/SEC.) = 3.65 DEPTH*VELOCITY (FT*FT/SEC.) = 2.67
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 24.0 INCH PIPE IS 12.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 15.08
PIPE-FLOW(CFS) = 23.58
PIPEFLOW TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 15.72
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.792
SUBAREA AREA (ACRES) = 19.35 SUBAREA RUNOFF (CFS) = 47.05
TOTAL AREA(ACRES) = 29.2 PEAK FLOW RATE(CFS) = 70.21
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
```

```
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 46.63
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.70
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.34
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.19
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 394.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 67.3 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11304.00
 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11304.00 = 1256.73 FEET.
*******************
 FLOW PROCESS FROM NODE 11304.00 TO NODE 11305.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1202.00 DOWNSTREAM ELEVATION(FEET) = 1190.00
 STREET LENGTH (FEET) = 882.18 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.33
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.18
 STREET FLOW TRAVEL TIME (MIN.) = 2.81 Tc (MIN.) = 18.52
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.530
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                      B 40.46 0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.53 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.129
 SUBAREA AREA (ACRES) = 42.99 SUBAREA RUNOFF (CFS) = 94.15
 EFFECTIVE AREA(ACRES) = 72.15 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 72.1 PEAK FLOW RATE (CFS) = 157.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
```

File name: LR0113ZZ.RES

Page 4

STREETFLOW HYDRAULICS BASED ON MAINLINE To :

Date: 04/21/2014

Date: 04/21/2014 File name: LR0113ZZ.RES Page 3

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 36.99
 FLOW VELOCITY (FEET/SEC.) = 5.60 DEPTH*VELOCITY (FT*FT/SEC.) = 4.93
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.29
 PIPE-FLOW(CFS) =
                    70.21
 PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 16.32
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.730
 SUBAREA AREA(ACRES) = 42.99 SUBAREA RUNOFF(CFS) = 101.87
 TOTAL AREA (ACRES) = 72.1 PEAK FLOW RATE (CFS) = 170.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 100.23
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.95
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.82
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 882.2 FT WITH ELEVATION-DROP = 12.0 FT, IS 131.4 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11305.00
 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11305.00 = 2138.91 FEET.
******************
 FLOW PROCESS FROM NODE 11305.00 TO NODE 11306.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1190.00 DOWNSTREAM ELEVATION(FEET) = 1176.00
 STREET LENGTH (FEET) = 1136.87 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 223.45
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.01
   HALFSTREET FLOOD WIDTH (FEET) = 43.28
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.88
 STREET FLOW TRAVEL TIME (MIN.) = 3.24 Tc (MIN.) = 19.56
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.449
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                          SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                       B 47.35 0.75 0.100
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.67 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.127
 SUBAREA AREA (ACRES) = 50.02 SUBAREA RUNOFF (CFS) = 105.97
 EFFECTIVE AREA(ACRES) = 122.17 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.13
 TOTAL AREA (ACRES) = 122.2 PEAK FLOW RATE (CFS) = 258.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.06 HALFSTREET FLOOD WIDTH(FEET) = 45.84
 FLOW VELOCITY (FEET/SEC.) = 6.04 DEPTH*VELOCITY (FT*FT/SEC.) = 6.38
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 28.64
 PIPE-FLOW(CFS) = 170.44
 PIPEFLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 16.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.665
 SUBAREA AREA (ACRES) = 50.02 SUBAREA RUNOFF (CFS) = 115.73
 TOTAL AREA (ACRES) = 122.2 PEAK FLOW RATE (CFS) = 281.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 111.55
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.98
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
  AND L = 1136.9 FT WITH ELEVATION-DROP = 14.0 FT, IS 141.9 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11306.00
 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11306.00 = 3275.78 FEET.
******************
```

FLOW PROCESS FROM NODE 11306.00 TO NODE 11316.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014 File name: LR011377.RFS

```
_____
 UPSTREAM ELEVATION(FEET) = 1176.00 DOWNSTREAM ELEVATION(FEET) = 1175.00
 STREET LENGTH (FEET) = 1316.52 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 288.41
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.80
   HALFSTREET FLOOD WIDTH (FEET) = 83.08
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.08
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.74
 STREET FLOW TRAVEL TIME (MIN.) = 10.56 Tc (MIN.) = 27.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.994
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp Ap
                                                          SCS
      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               1.13
                                          0.75 0.600 56
 COMMERCIAL
                      В
                                 6.52
                                          0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.174
 SUBAREA AREA(ACRES) = 7.65 SUBAREA RUNOFF(CFS) = 12.84
 EFFECTIVE AREA(ACRES) = 129.82 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 129.8 PEAK FLOW RATE (CFS) = 281.99
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.79 HALFSTREET FLOOD WIDTH(FEET) = 82.34
 FLOW VELOCITY (FEET/SEC.) = 2.07 DEPTH*VELOCITY (FT*FT/SEC.) = 3.70
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.91
 PIPE-FLOW(CFS) = 280.44
 PIPEFLOW TRAVEL TIME (MIN.) = 2.21 Tc (MIN.) = 19.20
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.476
 SUBAREA AREA(ACRES) = 7.65 SUBAREA RUNOFF(CFS) = 16.16
 TOTAL AREA(ACRES) = 129.8 PEAK FLOW RATE(CFS) = 281.99
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 1.55
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.35
  HALFSTREET FLOOD WIDTH (FEET) = 11.32
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 0.55
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.19
 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11316.00 = 4592.30 FEET.
******************
 FLOW PROCESS FROM NODE 11316.00 TO NODE 11316.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.20
 RAINFALL INTENSITY (INCH/HR) = 2.48
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.76
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 129.82
 TOTAL STREAM AREA(ACRES) = 129.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 281.99
******************
 FLOW PROCESS FROM NODE 11310.00 TO NODE 11311.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 877.57
 ELEVATION DATA: UPSTREAM(FEET) = 1212.50 DOWNSTREAM(FEET) = 1212.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 20.373
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.390
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL
                    B 4.70 0.75 0.100 56 20.37
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.21 0.75 0.600 56 27.61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.121
 SUBAREA RUNOFF(CFS) = 10.16
 TOTAL AREA (ACRES) = 4.91 PEAK FLOW RATE (CFS) = 10.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 11311.00 TO NODE 11312.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
```

Date: 04/21/2014 File name: LR0113ZZ.RES

Page 8

Date: 04/21/2014 File name: LR0113ZZ.RES Page 7

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.28
_____
 UPSTREAM NODE ELEVATION (FEET) = 1212.00
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.49
 DOWNSTREAM NODE ELEVATION (FEET) = 1211.50
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 2.21 Tc (MIN.) = 30.73
 CHANNEL LENGTH THRU SUBAREA (FEET) = 581.61
                                                                                 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.867
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                     LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                                      B 13.21 0.75 0.100
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 COMMERCIAL
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.953
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.43 0.75 0.600
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.116
     LAND USE
 RESIDENTIAL
                                                                                 SUBAREA AREA (ACRES) = 13.64 SUBAREA RUNOFF (CFS) = 21.86
                                                                                 EFFECTIVE AREA(ACRES) = 24.26 AREA-AVERAGED Fm(INCH/HR) = 0.10
 "3-4 DWELLINGS/ACRE"
                     В
                               0.82
                                        0.75
                                                0.600 56
 COMMERCIAL
                        В
                               4.89
                                        0.75 0.100 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 TOTAL AREA (ACRES) = 24.3 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.172
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.86
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 1.19
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AVERAGE FLOW DEPTH(FEET) = 0.77 FLOOD WIDTH(FEET) = 52.81
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 8.15 Tc(MIN.) = 28.52
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA(ACRES) = 5.71 SUBAREA RUNOFF(CFS) = 9.38
                                                                                 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 29.91
 EFFECTIVE AREA(ACRES) = 10.62 AREA-AVERAGED Fm(INCH/HR) = 0.11
                                                                                 FLOW VELOCITY (FEET/SEC.) = 2.45 DEPTH*VELOCITY (FT*FT/SEC.) = 1.74
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.15
                                                                                 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 TOTAL AREA(ACRES) = 10.6 PEAK FLOW RATE(CFS) =
                                                                                      AND L = 302.5 FT WITH ELEVATION-DROP = 1.5 FT, IS 48.1 CFS,
                                                                                       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11313.00
                                                                                 LONGEST FLOWPATH FROM NODE 11310.00 TO NODE 11313.00 = 1761.68 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                               *******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                 FLOW PROCESS FROM NODE 11313.00 TO NODE 11314.00 IS CODE = 63
                                                                                _____
 DEPTH(FEET) = 0.81 FLOOD WIDTH(FEET) = 56.69
 FLOW VELOCITY (FEET/SEC.) = 1.23 DEPTH*VELOCITY (FT*FT/SEC) = 0.99
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 11310.00 TO NODE 11312.00 = 1459.18 FEET.
                                                                                 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                               ______
******************
                                                                                 UPSTREAM ELEVATION(FEET) = 1210.00 DOWNSTREAM ELEVATION(FEET) = 1200.00
 FLOW PROCESS FROM NODE 11312.00 TO NODE 11313.00 IS CODE = 63
                                                                                 STREET LENGTH (FEET) = 564.52 CURB HEIGHT (INCHES) = 8.0
                                                                                 STREET HALFWIDTH (FEET) = 32.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
_____
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1211.50 DOWNSTREAM ELEVATION(FEET) = 1210.00
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 302.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREET FLOW DEPTH (FEET) = 0.67
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 26.00
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.44
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.794
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 24.62
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
```

Page 9

Date: 04/21/2014 File name: LR0113ZZ.RES

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.33 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.98 STREET FLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 32.85 SCS Page 10 Date: 04/21/2014 File name: LR0113ZZ.RES

SCS

38.65

```
LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.210
 COMMERCIAL
                       В
                               27.36
                                         0.75
                                                 0.100 56
                                                                                  SUBAREA AREA(ACRES) = 42.34
                                                                                                                SUBAREA RUNOFF (CFS) = 59.58
 RESIDENTIAL
                                                                                  EFFECTIVE AREA(ACRES) = 94.79 AREA-AVERAGED Fm(INCH/HR) = 0.12
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.16
 "3-4 DWELLINGS/ACRE" B
                              0.83 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  TOTAL AREA (ACRES) = 94.8 PEAK FLOW RATE (CFS) = 136.49
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.115
                               SUBAREA RUNOFF (CFS) = 43.34
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 28.19
 EFFECTIVE AREA(ACRES) = 52.45 AREA-AVERAGED Fm(INCH/HR) = 0.09
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 52.5 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 40.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW VELOCITY (FEET/SEC.) = 5.60 DEPTH*VELOCITY (FT*FT/SEC.) = 4.66
 5M = 0.46: 30M = 0.95: 1HR = 1.25: 3HR = 2.03: 6HR = 2.75: 24HR = 5.50
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                        AND L = 751.0 FT WITH ELEVATION-DROP = 15.0 FT, IS 138.9 CFS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11315.00
 DEPTH (FEET) = 0.73 HALFSTREET FLOOD WIDTH (FEET) = 31.94
                                                                                  LONGEST FLOWPATH FROM NODE 11310.00 TO NODE 11315.00 = 3077.21 FEET.
 FLOW VELOCITY (FEET/SEC.) = 4.72 DEPTH*VELOCITY (FT*FT/SEC.) = 3.45
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 564.5 FT WITH ELEVATION-DROP = 10.0 FT, IS 99.6 CFS,
                                                                                  FLOW PROCESS FROM NODE 11315.00 TO NODE 11316.00 IS CODE = 63
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11314.00
                                                                                ______
 LONGEST FLOWPATH FROM NODE 11310.00 TO NODE 11314.00 = 2326.20 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 FLOW PROCESS FROM NODE 11314.00 TO NODE 11315.00 IS CODE = 63
                                                                                  UPSTREAM ELEVATION(FEET) = 1185.00 DOWNSTREAM ELEVATION(FEET) = 1175.00
                                                                                  STREET LENGTH (FEET) = 753.50 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET HALFWIDTH (FEET) = 32.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 UPSTREAM ELEVATION(FEET) = 1200.00 DOWNSTREAM ELEVATION(FEET) = 1185.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 751.01 CURB HEIGHT (INCHES) = 8.0
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.96
                                                                                   STREET FLOW DEPTH(FEET) = 0.88
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 42.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.18
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.35
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.55 Tc (MIN.) = 37.79
   STREET FLOW DEPTH (FEET) = 0.79
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.650
   HALFSTREET FLOOD WIDTH (FEET) = 37.56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.26
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.14
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
 STREET FLOW TRAVEL TIME (MIN.) = 2.38 Tc (MIN.) = 35.23
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.720
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                      В
                                                                                                               1.03
                                                                                                                         0.75
                                                                                                                                 0.600
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                                                                  COMMERCIAL
                                                                                                      В
                                                                                                                5.97
                                                                                                                         0.75 0.100
                                      Fρ
                                                 αA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                       В
                              8.18 0.75
                                                 0.600 56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.174
 SCHOOL
 COMMERCIAL
                               33.04
                                         0.75
                                                 0.100 56
                                                                                  SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 9.58
                                                                                  EFFECTIVE AREA(ACRES) = 101.79 AREA-AVERAGED Fm(INCH/HR) = 0.12
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 1.12 0.75 0.600
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  TOTAL AREA (ACRES) = 101.8 PEAK FLOW RATE (CFS) = 140.03
```

Date: 04/21/2014 File name: LR0113ZZ.RES Page 11 Date: 04/21/2014 File name: LR0113ZZ.RES Page 12

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 ** PEAK FLOW RATE TABLE **
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 42.76
 FLOW VELOCITY (FEET/SEC.) = 4.91 DEPTH*VELOCITY (FT*FT/SEC.) = 4.33
                                                                                         O Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                       HEADWATER
                                                                                 NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                  1
                                                                                          397.50 19.20 2.476 0.75(0.11) 0.14 184.3 11302.00
                                                                                          334.86 35.86 1.702 0.75(0.11) 0.15 231.6 11310.00
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
                                                                                 PEAK FLOW RATE (CFS) = 397.50 Tc (MIN.) = 19.20
                                                                                 EFFECTIVE AREA(ACRES) = 184.31 AREA-AVERAGED Fm(INCH/HR) = 0.11
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.91
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 PIPE-FLOW(CFS) = 62.59
                                                                                 TOTAL AREA (ACRES) = 231.6
 PIPEFLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 35.86
                                                                                 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11316.00 = 4592.30 FEET.
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.702
                                                                               ******************
 SUBAREA AREA (ACRES) = 7.00 SUBAREA RUNOFF (CFS) = 9.91
 TOTAL AREA (ACRES) = 101.8 PEAK FLOW RATE (CFS) = 144.84
                                                                                 FLOW PROCESS FROM NODE 11316.00 TO NODE 11317.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 >>>> (STREET TABLE SECTION # 13 USED) <<<<
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                               ______
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 82.25
                                                                                 UPSTREAM ELEVATION(FEET) = 1175.00 DOWNSTREAM ELEVATION(FEET) = 1160.00
                                                                                 STREET LENGTH (FEET) = 1841.80 CURB HEIGHT (INCHES) = 8.0
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH (FEET) = 0.80 FLOOD WIDTH (FEET) = 38.58
                                                                                 STREET HALFWIDTH (FEET) = 32.00
   FULL HALF-STREET VELOCITY (FEET/SEC.) = 4.32
   SPLIT DEPTH(FEET) = 0.73 SPLIT FLOOD WIDTH(FEET) = 32.25
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
   SPLIT FLOW(CFS) = 35.37 SPLIT VELOCITY(FEET/SEC.) = 4.10
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 38.58
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.32
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.45
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 LONGEST FLOWPATH FROM NODE 11310.00 TO NODE 11316.00 = 3830.71 FEET.
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
FLOW PROCESS FROM NODE 11316.00 TO NODE 11316.00 IS CODE = 1
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 425.96
______
                                                                                  ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH(FEET) = 1.32
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 64.73
 TOTAL NUMBER OF STREAMS = 2
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.62
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.43
 TIME OF CONCENTRATION (MIN.) = 35.86
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 5.46 Tc (MIN.) = 24.66
 RAINFALL INTENSITY (INCH/HR) = 1.70
                                                                                 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.131
 AREA-AVERAGED Fm(INCH/HR) = 0.12
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                               Ар
                                                                                                                                       SCS
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Ap = 0.16
 EFFECTIVE STREAM AREA(ACRES) = 101.79
                                                                                                      B 9.92 0.75 0.600
                                                                                 SCHOOL
 TOTAL STREAM AREA(ACRES) = 101.79
                                                                                 RESIDENTIAL
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 144.84
                                                                                 "3-4 DWELLINGS/ACRE" B 1.74 0.75 0.600
                                                                                                                                        56
                                                                                                      B 21.20 0.75 0.100
                                                                                 COMMERCIAL
 ** CONFLUENCE DATA **
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.277
  STREAM O Tc Intensity Fp(Fm) Ap Ae
                                                       HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 SUBAREA AREA (ACRES) = 32.86 SUBAREA RUNOFF (CFS) = 56.89
          281.99 19.20 2.476 0.76(0.10) 0.14 129.8 11302.00
                                                                                 EFFECTIVE AREA(ACRES) = 217.17 AREA-AVERAGED Fm(INCH/HR) = 0.12
```

Page 13

Date: 04/21/2014 File name: LR0113ZZ.RES

2 144.84 35.86 1.702 0.75(0.12) 0.16 101.8 11310.00

Date: 04/21/2014 File name: LR0113ZZ.RES

Page 14

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.16
 TOTAL AREA (ACRES) =
                     264.5
                                 PEAK FLOW RATE (CFS) = 397.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.29 HALFSTREET FLOOD WIDTH(FEET) = 63.27
 FLOW VELOCITY (FEET/SEC.) = 5.52 DEPTH*VELOCITY (FT*FT/SEC.) = 7.13
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 25.78
 PIPE-FLOW(CFS) = 366.07
 PIPEFLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 20.39
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.389
 SUBAREA AREA (ACRES) = 32.86 SUBAREA RUNOFF (CFS) = 64.51
 TOTAL AREA(ACRES) = 264.5
                                 PEAK FLOW RATE (CFS) = 442.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 76.75
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 38.97
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.77
  ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
           442.82 20.39 2.389 0.75(0.12) 0.16 217.2 11302.00
    1
           369.00 36.91 1.673 0.75 (0.12) 0.16
                                                  264.5 11310.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 442.82 Tc (MIN.) = 20.39
 AREA-AVERAGED Fm(INCH/HR) = 0.12 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.16 EFFECTIVE AREA(ACRES) = 217.17
 LONGEST FLOWPATH FROM NODE 11302.00 TO NODE 11317.00 = 6434.10 FEET.
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 264.5 TC (MIN.) = 20.39
 EFFECTIVE AREA (ACRES) = 217.17 AREA-AVERAGED Fm (INCH/HR) = 0.12
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.164
 PEAK FLOW RATE (CFS) = 442.82
 ** PEAK FLOW RATE TABLE **
                  Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM O
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 442.82 20.39 2.389 0.75(0.12) 0.16 217.2 11302.00
           369.00 36.91 1.673 0.75 (0.12) 0.16 264.5 11310.00
```

\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0113ZZ.RES Page 15 Date: 04/21/2014 File name: LR0113ZZ.RES Page 16

Date: 04/21/2014 File name: LR0113ZZ.RES Page 17 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

# Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11437 (FILE LR0114ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0114ZZ.DAT

TIME/DATE OF STUDY: 16:43 10/25/2013

-----

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 22.0 0.020/0.020/0.020 15.0 0.67 2.00 0.0313 0.167 0.0180 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 18 26.0							
	10.0	0.020/0.02	0/0.020	0.50	1.50 0.0312	0.125	0.0180
19 52.0	20.0	0.020/0.02	0/0.020	0.67	2.00 0.0312	0.167	0.0180
GLOBAL STRI  1. Relat: as (Ma 2. (Deptil *SIZE PIPE OR EQUAL ' *USER-SPEC:  UNIT-HYDROO WATERSHEI USED "VAI 1 UNITS/I FOR DEVEL PRECIPITY SIERRA MI	CET FLOW-D ive Flow-D aximum All 1) * (Veloci WITH A FL TO THE UPS IFIED MINI GRAPH MODE D LAG = 0. LLEY UNDEV ACRE AND L LOPMENTS O ATION DATA ADRE DEPTH	EPTH CONSTR epth = 0.2 owable Stre ty) Constra OW CAPACITY TREAM TRIBU MUM TOPOGRA  L SELECTION 80 * Tc ELOPED" S-G ESS; AND "V F 2 UNITS/A ENTERED ON -AREA FACTO	AINTS: 0 FEET et Flow I int = 6. GREATER TARY PIPE PHIC SLOE S/PARAMET RAPH FOR ALLEY DEV CRE AND N SUBAREA RS USED.	Depth) - 0 (FT*FT THAN C.* PE ADJUST PERS: DEVELOPM VELOPED" MORE. BASIS.	(Top-of-Curb)  "/S)  MENT NOT SELE  MENTS OF S-GRAPH	CTED	
				ASSUMED F	OR UNIT HYDRO	GRAPH	METHOD
"ANIECEDENI	MOISTORE	CONDITION (	AMC) II F	ROSUMED F	OK UNII HIDRO	JRAPH	MEINOD
******	*****	******	******	******	********	*****	*****
FIOW PROCES	SS FROM NO	DE 11400 0	O TO NODE	11401	00 IS CODE =	21	
						21	
>>>> RATIO	NAL METHOD	INITIAL SU	BAREA ANA	ALYSIS<<<	:<<		
					L SUBAREA<<		
>>USE TIME	-OF-CONCEN	TRATION NOM	OGRAPH FO	OR INITIA	IL SUBAREA		
			=======			=====	
TNITTIAL CIII	SYDEN EIUM	-TENCTH (FFF	T) = 88	21 61			
		-LENGTH (FEE					
					ISTREAM(FEET)	= 12	08.00
					ISTREAM(FEET)	= 12	08.00
ELEVATION I	DATA: UPST	REAM(FEET)	= 1210.	00 DOWN		= 12	08.00
ELEVATION D	DATA: UPST ENGTH** 3.	REAM(FEET)	= 1210.	00 DOWN GE)]**0.2	0	= 12	08.00
ELEVATION I  TC = K*[(LI  SUBAREA ANA	DATA: UPST ENGTH** 3. ALYSIS USE	REAM(FEET) 00)/(ELEVAT D MINIMUM T	= 1210. ION CHANG c(MIN.) =	00 DOWN GE)]**0.2 = 15.51	0	= 12	08.00
ELEVATION I  TC = K*[(LI  SUBAREA ANA	DATA: UPST ENGTH** 3. ALYSIS USE	REAM(FEET)	= 1210. ION CHANG c(MIN.) =	00 DOWN GE)]**0.2 = 15.51	0	= 12	08.00
Tc = K*[(Li SUBAREA ANA * 100 YEAR	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I	= 1210.  ION CHANG c(MIN.) = NCH/HR) =	00 DOWN GE)]**0.2 = 15.51 = 2.814	0	= 12	08.00
Tc = K*[(LI SUBAREA AND * 100 YEAR SUBAREA Tc	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A	= 1210.  ION CHANC c(MIN.) = NCH/HR) = MC II):	00 DOWN GE)]**0.2 = 15.51 = 2.814	20		
Tc = K*[(LI SUBAREA AND * 100 YEAR SUBAREA Tc	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI	= 1210.  ION CHANC c(MIN.) = NCH/HR) = MC II): L AREA	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp	10 4 Ap	SCS	Tc
Tc = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI	= 1210.  ION CHANC c(MIN.) = NCH/HR) = MC II): L AREA	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp	10 4 Ap	SCS	Tc
Tc = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI	= 1210.  ION CHANC c(MIN.) = NCH/HR) = MC II): L AREA	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp	20	SCS	Tc
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAL	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE	REAM (FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp (INCH/	20 .4 Ap (HR) (DECIMAL	SCS ) CN	Tc (MIN.
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAL	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE	REAM (FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp (INCH/	20 .4 Ap (HR) (DECIMAL	SCS ) CN	Tc (MIN.
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAL	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE	REAM (FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)	00 DOWN GE)]**0.2 = 15.51 = 2.814 Fp (INCH/	10 4 Ap	SCS ) CN	Tc (MIN.
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE"	REAM (FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B B	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  0.99 5.80	DOWN  SE)]**0.2 = 15.51 = 2.814  Fp (INCH/	Ap (HR) (DECIMAL 75 0.600 75 0.100	SCS ) CN	Tc (MIN.
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL SUBAREA AVI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV	REAM (FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 0.99 5.80 ATE, Fp(1	DOWN  DOWN  DE) ] **0.2  15.51  2.814  Fp (INCH/  0.0.  CNCH/HR)	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75	SCS ) CN	Tc (MIN.
Tc = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL' COMMERCIAL SUBAREA AVI SUBAREA AVI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV ERAGE PERV	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 0.99 5.80 ATE, Fp(I RACTION,	DOWN  DOWN  DE) ] **0.2  15.51  2.814  Fp (INCH/  0.0.  CNCH/HR)	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75	SCS ) CN	Tc (MIN.
Tc = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL' COMMERCIAL SUBAREA AVI SUBAREA AVI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV ERAGE PERV	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 0.99 5.80 ATE, Fp(I RACTION,	DOWN  DOWN  DE) ] **0.2  15.51  2.814  Fp (INCH/  0.0.  CNCH/HR)	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75	SCS ) CN	Tc (MIN.
TC = K*[(LI SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA RUI SUBAREA RUI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS)	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41	= 1210.  ION CHANC  (MIN.) =  NCH/HR) =  MC II):  L AREA  (ACRES)  0.99  5.80  ATE, Fp(1  RACTION,	GE)]**0.2 = 15.51 = 2.814 Fp (INCH/ ) 0. 0. CNCH/HR) Ap = 0.	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173	SCS ) CN 56 56	Tc (MIN.
TC = K*[(LI SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA RUI SUBAREA RUI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS)	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41	= 1210.  ION CHANC  (MIN.) =  NCH/HR) =  MC II):  L AREA  (ACRES)  0.99  5.80  ATE, Fp(1  RACTION,	GE)]**0.2 = 15.51 = 2.814 Fp (INCH/ ) 0. 0. CNCH/HR) Ap = 0.	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75	SCS ) CN 56 56	Tc (MIN.
TC = K*[(LI SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA RUI SUBAREA RUI	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS)	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41	= 1210.  ION CHANC  (MIN.) =  NCH/HR) =  MC II):  L AREA  (ACRES)  0.99  5.80  ATE, Fp(1  RACTION,	GE)]**0.2 = 15.51 = 2.814 Fp (INCH/ ) 0. 0. CNCH/HR) Ap = 0.	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173	SCS ) CN 56 56	Tc (MIN.
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA RUI TOTAL AREA	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) =	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41	= 1210.  ION CHANC C(MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  0.99 5.80 ATE, FP(I RACTION, PEAK FLO	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ ) 0. CNCH/HR) Ap = 0.  W RATE (C	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173	SCS ) CN 56 56	Tc (MIN.
TC = K*[(LI SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, FP(I RACTION, PEAK FLO	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ ) 0. CNCH/HR) Ap = 0.  WW RATE (CCH):	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173  EFS) = 16.	SCS ) CN 56 56 56	Tc (MIN. 21.0 15.5
TC = K*[(LI SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIAI "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, FP(I RACTION, PEAK FLO	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ ) 0. CNCH/HR) Ap = 0.  WW RATE (CCH):	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173	SCS ) CN 56 56 56	Tc (MIN. 21.0 15.5
TC = K*[(LH SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS UT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 5.80 ATE, Fp(1 RACTION, PEAK FLO DEPTH(INC 85; 3HR =	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. 1 NCH/HR) Ap = 0.  WW RATE (CCH): = 1.39; 6	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173 (FS) = 16.	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0 15.5
TC = K*[(LH SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS UT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.	= 1210.  ION CHANC C(MIN.) = NCH/HR) = MC II): L AREA (ACRES) 5.80 ATE, Fp(1 RACTION, PEAK FLO DEPTH(INC 85; 3HR =	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. 1 NCH/HR) Ap = 0.  WW RATE (CCH): = 1.39; 6	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173  EFS) = 16.	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0 15.5
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEI LAND U RESIDENTIA! "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS VT TYPE/ USE LINGS/ACRE" ERAGE PERV ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.	= 1210.  ION CHANC C(MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, FP(II) RACTION, PEAK FLO DEPTH(INC 85; 3HR =	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ ) 0. CNCH/HR) Ap = 0.  WW RATE (CC) CH): = 1.39; 6	Ap (HR) (DECIMAL 75	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0.15.5)
TC = K*[(LH SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  ***********************************	= 1210.  ION CHANC  c(MIN.) =  NCH/HR) =  MC II):  L AREA  (ACRES)  5.80  ATE, Fp(1)  RACTION,  PEAK FLO  DEPTH (INC 85; 3HR =  ***********************************	Fp (INCH/HR) Ap = 0.  CH): = 1.39; 6  ***********************************	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173  CFS) = 16.  CHR = 1.90; 24:  ***********************************	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0.15.5)
TC = K*[(LH SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  ***********************************	= 1210.  ION CHANC  c(MIN.) =  NCH/HR) =  MC II):  L AREA  (ACRES)  5.80  ATE, Fp(I  RACTION,  PEAK FLO  DEPTH (INC  85; 3HR =  ***********************************	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ ) 0. INCH/HR) Ap = 0.  WW RATE (CC) CH): = 1.39; 6	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA AN. * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL. COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS WT TYPE/ JSE LINGS/ACRE" ERAGE PERV ROFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  ************ DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLO DEPTH (INC 85; 3HR = ************************************	Fp (INCH/HR) Ap = 0.  W RATE (CCH): = 1.39; 6	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA AN. * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL. COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS WT TYPE/ JSE LINGS/ACRE" ERAGE PERV ROFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  ***********************************	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLO DEPTH (INC 85; 3HR = ************************************	Fp (INCH/HR) Ap = 0.  W RATE (CCH): = 1.39; 6	Ap (HR) (DECIMAL 75 0.600 75 0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0 15.5
TC = K*[(Li SUBAREA AN. * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL. COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31; ************************************	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS WI TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 *********** ES FROM NO	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  ***********  DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLO DEPTH (INC 85; 3HR = *********** 0 TO NODE TIME THE USED) <<<	Fp (INCH/HR) Ap = 0.  WW RATE (C) CH): 1.39; 6  ***********************************	Ap (HR) (DECIMAL 75     0.600 75     0.100 = 0.75 173 (FS) = 16. (SHR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND URBENTAL "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31;	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JUSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 ********** SS FROM NO	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  *********** DE 11401.0	= 1210.  ION CHANC C(MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  0.99 5.80 ATE, Fp(I RACTION, PEAK FLO DEPTH(INO 85; 3HR = ********* 0 TO NODE TIME THI USED) <<<==================================	DOWN  SE) ] **0.2  = 15.51  = 2.814  Fp (INCH/  0.0  CNCH/HR)  Ap = 0.0  WRATE (COMMENTED TO THE COMMENTED TO THE COMMENTED TO THE COMMENTED TO THE COMMENT TO THE COMENT TO THE COMMENT TO THE COMMENT TO THE COMMENT TO THE COMMENT T	Ap (HR) (DECIMAL 75    0.600 75    0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) ************************************	SCS ) CN 56 56 41 HR = 3 *****	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31; ************************************	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 ********** ESS FROM NO	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  **********  DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLC DEPTH (INC 85; 3HR = ********** 0 TO NODE TIME THE USED) <<<========= .00 DOWN	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. CNCH/HR) Ap = 0. W RATE (CC) CH): = 1.39; 6  ******** C 11402	Ap (HR) (DECIMAL 75     0.600 75     0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3 *****	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAL "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31; ************************************	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 ********** ESS FROM NO	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  **********  DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLC DEPTH (INC 85; 3HR = ********** 0 TO NODE TIME THE USED) <<<========= .00 DOWN	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. CNCH/HR) Ap = 0. W RATE (CC) CH): = 1.39; 6  ******** C 11402	Ap (HR) (DECIMAL 75    0.600 75    0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) ************************************	SCS ) CN 56 56 41 HR = 3 *****	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31; ************************************	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 ********** ESS FROM NO	REAM(FEET)  00) / (ELEVAT D MINIMUM T INTENSITY (I RATE DATA (A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  *********  DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLC DEPTH (INC 85; 3HR = ********** 0 TO NODE TIME THE USED) <<<========= .00 DOWN	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. CNCH/HR) Ap = 0. W RATE (CC) CH): = 1.39; 6  ******** C 11402	Ap (HR) (DECIMAL 75     0.600 75     0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3 *****	Tc (MIN. 21.0.15.5)
TC = K*[(Li SUBAREA ANA * 100 YEAR SUBAREA TC DEVELOPMEN LAND U RESIDENTIAN "3-4 DWELL: COMMERCIAL SUBAREA AVI SUBAREA AVI SUBAREA RUI TOTAL AREA SUBAREA ARI 5M = 0.31; ************************************	DATA: UPST ENGTH** 3. ALYSIS USE RAINFALL AND LOSS NT TYPE/ JSE LINGS/ACRE" ERAGE PERV NOFF(CFS) (ACRES) = EA-AVERAGE 30M = 0.6 ********** ESS FROM NO	REAM(FEET)  00)/(ELEVAT D MINIMUM T INTENSITY(I RATE DATA(A SCS SOI GROUP  B B IOUS LOSS R IOUS AREA F = 16.41 6.79  D RAINFALL 4; 1HR = 0.  **********  DE 11401.0	= 1210.  ION CHANC C (MIN.) = NCH/HR) = NCH/HR) = MC II): L AREA (ACRES)  5.80 ATE, Fp(1 RACTION, PEAK FLC DEPTH (INC 85; 3HR = ********** 0 TO NODE TIME THE USED) <<<========= .00 DOWN	GE)]**0.2 = 15.51 = 2.814  Fp (INCH/ 0 0. CNCH/HR) Ap = 0. W RATE (CC) CH): = 1.39; 6  ******** C 11402	Ap (HR) (DECIMAL 75     0.600 75     0.100 = 0.75 173 (FS) = 16. (HR = 1.90; 24) (************************************	SCS ) CN 56 56 41 HR = 3 *****	Tc (MIN. 21.0.15.5)

Page 2

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.43
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.56
 STREET FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 16.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.727
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                       B 4.86 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.122
 SUBAREA AREA (ACRES) = 5.08 SUBAREA RUNOFF (CFS) = 12.05
 EFFECTIVE AREA(ACRES) = 11.87 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.15
 TOTAL AREA (ACRES) = 11.9 PEAK FLOW RATE (CFS) = 27.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.89; 24HR = 3.37
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 3.40 DEPTH*VELOCITY (FT*FT/SEC.) = 1.79
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 156.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 23.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11402.00
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11402.00 = 1041.14 FEET.
******************
 FLOW PROCESS FROM NODE 11402.00 TO NODE 11403.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1206.00 DOWNSTREAM ELEVATION(FEET) = 1202.00
 STREET LENGTH (FEET) = 419.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 41.10
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.13
 STREET FLOW TRAVEL TIME (MIN.) = 2.00 Tc (MIN.) = 18.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.544
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                      B 11.37 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.123
 SUBAREA AREA(ACRES) = 11.93 SUBAREA RUNOFF(CFS) = 26.33
 EFFECTIVE AREA(ACRES) = 23.80 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA(ACRES) = 23.8 PEAK FLOW RATE(CFS) =
                                                         52.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.37; 6HR = 1.85; 24HR = 3.28
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.66 HALFSTREET FLOOD WIDTH (FEET) = 25.76
 FLOW VELOCITY (FEET/SEC.) = 3.73 DEPTH*VELOCITY (FT*FT/SEC.) = 2.45
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 419.5 FT WITH ELEVATION-DROP = 4.0 FT, IS 42.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11403.00
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11403.00 = 1460.64 FEET.
******************
 FLOW PROCESS FROM NODE 11403.00 TO NODE 11404.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1202.00 DOWNSTREAM ELEVATION(FEET) = 1193.00
 STREET LENGTH(FEET) = 817.00 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
```

Page 4

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0114ZZ.RES Page 3 Date: 04/21/2014 File name: LR0114ZZ.RES

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.72
 HALFSTREET FLOOD WIDTH (FEET) = 29.00
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.35
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.13
STREET FLOW TRAVEL TIME (MIN.) = 3.13 Tc (MIN.) = 21.48
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.315
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
COMMERCIAL
                       B 22.97
                                          0.75
                                                   0.100
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.11 0.75 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.123
SUBAREA AREA(ACRES) = 24.08 SUBAREA RUNOFF(CFS) = 48.18
EFFECTIVE AREA(ACRES) = 47.88 AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
TOTAL AREA (ACRES) = 47.9 PEAK FLOW RATE (CFS) =
                                                            95.57
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.33; 6HR = 1.76; 24HR = 3.15
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.62
FLOW VELOCITY (FEET/SEC.) = 4.61 DEPTH*VELOCITY (FT*FT/SEC.) = 3.56
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 24.0 INCH PIPE IS 18.1 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 20.56
PIPE-FLOW(CFS) =
                   52.30
PIPEFLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 19.02
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.491
SUBAREA AREA (ACRES) = 24.08 SUBAREA RUNOFF (CFS) = 51.99
TOTAL AREA (ACRES) = 47.9 PEAK FLOW RATE (CFS) = 103.14
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.33; 6HR = 1.76; 24HR = 3.15
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 50.84
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.64
 HALFSTREET FLOOD WIDTH (FEET) = 24.79
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.90
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.48
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 817.0 FT WITH ELEVATION-DROP = 9.0 FT, IS 73.2 CFS,
      WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11404.00
LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11404.00 = 2277.64 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1193.00 DOWNSTREAM ELEVATION(FEET) = 1178.00
 STREET LENGTH (FEET) = 1414.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 37.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.40
 STREET FLOW TRAVEL TIME (MIN.) = 4.74 Tc (MIN.) = 23.75
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.180
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    αA
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                        B 37.11 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.28 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.152
 SUBAREA AREA (ACRES) = 41.39 SUBAREA RUNOFF (CFS) = 76.97
 EFFECTIVE AREA(ACRES) = 89.27 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 89.3 PEAK FLOW RATE (CFS) = 166.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.58; 24HR = 3.08
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.93 HALFSTREET FLOOD WIDTH(FEET) = 39.74
 FLOW VELOCITY (FEET/SEC.) = 5.16 DEPTH*VELOCITY (FT*FT/SEC.) = 4.82
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 33.0 INCH PIPE IS 22.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.37
 PIPE-FLOW(CFS) = 103.14
 PIPEFLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 19.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.418
```

File name: LR0114ZZ.RES

Page 6

Date: 04/21/2014

FLOW PROCESS FROM NODE 11404.00 TO NODE 11405.00 IS CODE = 63

Date: 04/21/2014 File name: LR0114ZZ.RES Page 5

```
SUBAREA AREA (ACRES) = 41.39 SUBAREA RUNOFF (CFS) = 85.84
 TOTAL AREA (ACRES) = 89.3 PEAK FLOW RATE (CFS) = 185.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.58; 24HR = 3.08
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 82.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 30.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.39
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1414.5 FT WITH ELEVATION-DROP = 15.0 FT, IS 108.5 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11405.00
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11405.00 = 3692.14 FEET.
******************
 FLOW PROCESS FROM NODE 11405.00 TO NODE 11406.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1178.00 DOWNSTREAM ELEVATION(FEET) = 1147.00
 STREET LENGTH (FEET) = 2238.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                231.93
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.00
   HALFSTREET FLOOD WIDTH (FEET) = 42.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.16
 STREET FLOW TRAVEL TIME (MIN.) = 6.04 Tc (MIN.) = 26.03
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.063
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                aα
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      в 48.37
 COMMERCIAL
                                         0.75
                                                 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              3.81 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.137
 SUBAREA AREA (ACRES) = 52.18 SUBAREA RUNOFF (CFS) = 92.10
 EFFECTIVE AREA(ACRES) = 141.45 AREA-AVERAGED Fm(INCH/HR) = 0.10
```

```
TOTAL AREA (ACRES) =
                     141.4 PEAK FLOW RATE (CFS) =
                                                            249.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.02 HALFSTREET FLOOD WIDTH(FEET) = 44.20
 FLOW VELOCITY (FEET/SEC.) = 6.27 DEPTH*VELOCITY (FT*FT/SEC.) = 6.42
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 29.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 30.36
 PIPE-FLOW(CFS) = 185.83
 PIPEFLOW TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 21.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.333
 SUBAREA AREA (ACRES) = 52.18 SUBAREA RUNOFF (CFS) = 104.75
 TOTAL AREA (ACRES) = 141.4 PEAK FLOW RATE (CFS) = 283.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 97.92
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.52
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.06
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.79
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 2238.5 FT WITH ELEVATION-DROP = 31.0 FT, IS 126.7 CFS,
        WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11406.00
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11406.00 = 5930.64 FEET.
********************
 FLOW PROCESS FROM NODE 11406.00 TO NODE 11416.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1141.00 DOWNSTREAM ELEVATION(FEET) = 1140.00
 STREET LENGTH (FEET) = 1299.52 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
```

AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14

Date: 04/21/2014 File name: LR0114ZZ.RES Page 7

File name: LR0114ZZ.RES

Date: 04/21/2014

Page 8

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.69
   HALFSTREET FLOOD WIDTH (FEET) = 90.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.45
 STREET FLOW TRAVEL TIME (MIN.) = 10.59 Tc (MIN.) = 31.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.830
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                                1.56
                                           0.75 0.600 56
                       В
                                5.41
                                        0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.212
 SUBAREA AREA(ACRES) = 6.97 SUBAREA RUNOFF(CFS) = 10.48
 EFFECTIVE AREA(ACRES) = 148.42 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 148.4 PEAK FLOW RATE (CFS) = 283.75
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.24
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.68 HALFSTREET FLOOD WIDTH(FEET) = 89.47
 FLOW VELOCITY (FEET/SEC.) = 2.04 DEPTH*VELOCITY (FT*FT/SEC.) = 3.41
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.96
 PIPE-FLOW(CFS) = 281.84
 PIPEFLOW TRAVEL TIME (MIN.) = 2.17 Tc (MIN.) = 23.39
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.200
 SUBAREA AREA(ACRES) = 6.97 SUBAREA RUNOFF(CFS) = 12.81
 TOTAL AREA (ACRES) = 148.4
                                 PEAK FLOW RATE (CFS) = 283.75
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.24
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 1.91
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 11.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 0.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.23
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11416.00 = 7230.16 FEET.
****************
 FLOW PROCESS FROM NODE 11416.00 TO NODE 11416.00 IS CODE = 1
```

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.39
 RAINFALL INTENSITY (INCH/HR) = 2.20
 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 148.42
 TOTAL STREAM AREA(ACRES) = 148.42
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 283.75
******************
 FLOW PROCESS FROM NODE 11410.00 TO NODE 11411.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 735.08
 ELEVATION DATA: UPSTREAM(FEET) = 1208.00 DOWNSTREAM(FEET) = 1207.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.947
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.768
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                            1.04 0.75 0.600 56 21.61
 COMMERCIAL
                     В
                            3.02 0.75 0.100 56 15.95
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.228
 SUBAREA RUNOFF (CFS) = 9.49
 TOTAL AREA(ACRES) = 4.06 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 11411.00 TO NODE 11412.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1207.00 DOWNSTREAM ELEVATION(FEET) = 1205.00
 STREET LENGTH (FEET) = 156.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

File name: LR0114ZZ.RES

Page 10

Date: 04/21/2014

Date: 04/21/2014 File name: LR0114ZZ.RES Page 9

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 14.72
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.22
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 16.91
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.673
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                     Fρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                     B 2.68 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118
 SUBAREA AREA(ACRES) = 2.78 SUBAREA RUNOFF(CFS) = 6.47
 EFFECTIVE AREA(ACRES) = 6.84 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.18
 TOTAL AREA (ACRES) = 6.8 PEAK FLOW RATE (CFS) = 15.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 16.04
 FLOW VELOCITY(FEET/SEC.) = 2.82 DEPTH*VELOCITY(FT*FT/SEC.) = 1.35
 LONGEST FLOWPATH FROM NODE 11410.00 TO NODE 11412.00 = 891.08 FEET.
*****
 FLOW PROCESS FROM NODE 11412.00 TO NODE 11413.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1205.00 DOWNSTREAM ELEVATION (FEET) = 1200.00
 STREET LENGTH (FEET) = 426.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.63
 STREET FLOW TRAVEL TIME (MIN.) = 2.37 Tc (MIN.) = 19.28
```

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.470
 SUBAREA LOSS RATE DATA (AMC II):
                                    Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     B 6.67 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.48 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
 SUBAREA AREA (ACRES) = 7.15 SUBAREA RUNOFF (CFS) = 15.25
 EFFECTIVE AREA(ACRES) = 13.99 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.16
 TOTAL AREA (ACRES) = 14.0 PEAK FLOW RATE (CFS) =
                                                        29.62
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.07
 FLOW VELOCITY (FEET/SEC.) = 3.20 DEPTH*VELOCITY (FT*FT/SEC.) = 1.85
 LONGEST FLOWPATH FROM NODE 11410.00 TO NODE 11413.00 = 1317.58 FEET.
FLOW PROCESS FROM NODE 11413.00 TO NODE 11414.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1200.00 DOWNSTREAM ELEVATION(FEET) = 1190.00
 STREET LENGTH (FEET) = 803.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  42.80
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.04
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.59
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.29
 STREET FLOW TRAVEL TIME (MIN.) = 3.73 Tc (MIN.) = 23.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.221
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              αA
                                                      SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                             12.79 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.03 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.137
```

File name: LR0114ZZ.RES

Page 12

Date: 04/21/2014

Date: 04/21/2014 File name: LR0114ZZ.RES Page 11

```
SUBAREA AREA (ACRES) = 13.82 SUBAREA RUNOFF (CFS) = 26.35
                                                                                   DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 41.56
 EFFECTIVE AREA(ACRES) = 27.81 AREA-AVERAGED Fm(INCH/HR) = 0.11
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.96 DEPTH*VELOCITY (FT*FT/SEC.) = 3.28
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.15
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
 TOTAL AREA (ACRES) = 27.8 PEAK FLOW RATE (CFS) =
                                                          52.84
                                                                                        AND L = 1393.0 FT WITH ELEVATION-DROP = 15.0 FT, IS 80.6 CFS,
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11415.00
                                                                                   LONGEST FLOWPATH FROM NODE 11410.00 TO NODE 11415.00 = 3513.58 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.88; 24HR = 3.39
                                                                                 *******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   FLOW PROCESS FROM NODE 11415.00 TO NODE 11416.00 IS CODE = 63
 DEPTH (FEET) = 0.68 HALFSTREET FLOOD WIDTH (FEET) = 26.87
                                                                                 _____
 FLOW VELOCITY(FEET/SEC.) = 3.76 DEPTH*VELOCITY(FT*FT/SEC.) = 2.56
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 LONGEST FLOWPATH FROM NODE 11410.00 TO NODE 11414.00 = 2120.58 FEET.
                                                                                  >>>> (STREET TABLE SECTION # 14 USED) <<<<
******************
                                                                                   UPSTREAM ELEVATION(FEET) = 1175.00 DOWNSTREAM ELEVATION(FEET) = 1140.00
 FLOW PROCESS FROM NODE 11414.00 TO NODE 11415.00 IS CODE = 63
                                                                                   STREET LENGTH (FEET) = 2260.01 CURB HEIGHT (INCHES) = 8.0
______
                                                                                   STREET HALFWIDTH (FEET) = 39.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1190.00 DOWNSTREAM ELEVATION(FEET) = 1175.00
 STREET LENGTH (FEET) = 1393.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH(FEET) = 0.90
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 48.91
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.02
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.52
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 7.51 Tc (MIN.) = 36.58
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.682
   STREET FLOW DEPTH(FEET) = 0.78
                                                                                   SUBAREA LOSS RATE DATA(AMC II):
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA Fp
   HALFSTREET FLOOD WIDTH (FEET) = 36.72
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.83
                                                                                                       в 77.34 0.75 0.100 56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.99
                                                                                   COMMERCIAL
 STREET FLOW TRAVEL TIME (MIN.) = 6.06 Tc (MIN.) = 29.07
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" B 4.97 0.75 0.600
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.931
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.130
                                      Fρ
                                                Aρ
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   SUBAREA AREA(ACRES) = 82.31 SUBAREA RUNOFF(CFS) = 117.39
                      в 27.49 0.75
                                                                                   EFFECTIVE AREA(ACRES) = 140.66 AREA-AVERAGED Fm(INCH/HR) = 0.10
                                                 0.100 56
 COMMERCIAL
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.05 0.75 0.600 56
                                                                                   TOTAL AREA (ACRES) = 140.7 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.150
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 30.54 SUBAREA RUNOFF (CFS) = 49.98
                                                                                   5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.24
 EFFECTIVE AREA(ACRES) = 58.35 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.15
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 58.3 PEAK FLOW RATE (CFS) =
                                                                                   DEPTH(FEET) = 0.97 HALFSTREET FLOOD WIDTH(FEET) = 53.95
                                                                                   FLOW VELOCITY (FEET/SEC.) = 5.34 DEPTH*VELOCITY (FT*FT/SEC.) = 5.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.29; 6HR = 1.67; 24HR = 3.25
                                                                                   *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
```

Page 13

Date: 04/21/2014

File name: LR0114ZZ.RES

Date: 04/21/2014 File name: LR0114ZZ.RES Page 14

154.32

SCS

199.88

```
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.23
 PIPE-FLOW(CFS) = 92.43
 PIPEFLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 30.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.869
 SUBAREA AREA(ACRES) = 82.31 SUBAREA RUNOFF(CFS) = 131.23
 TOTAL AREA (ACRES) = 140.7 PEAK FLOW RATE(CFS) = 223.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.24
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 131.09
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
  HALFSTREET FLOOD WIDTH (FEET) = 44.84
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.86
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.19
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 2260.0 FT WITH ELEVATION-DROP = 35.0 FT, IS 202.5 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 11416.00
 LONGEST FLOWPATH FROM NODE 11410.00 TO NODE 11416.00 = 5773.59 FEET.
******************
 FLOW PROCESS FROM NODE 11416.00 TO NODE 11416.00 IS CODE = 1
._____
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 30.69
 RAINFALL INTENSITY (INCH/HR) = 1.87
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 140.66
 TOTAL STREAM AREA(ACRES) = 140.66
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 223.52
 ** CONFLUENCE DATA **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                         (ACRES) NODE
          283.75 23.39 2.200 0.75(0.11) 0.14 148.4 11400.00
    1
          223.52 30.69 1.869 0.75(0.10) 0.14 140.7 11410.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          486.00 23.39 2.200 0.75(0.11) 0.14 255.6 11400.00
          462.38 30.69 1.869 0.75(0.10) 0.14 289.1 11410.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 486.00 Tc (MIN.) = 23.39
```

```
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 289.1
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11416.00 = 7230.16 FEET.
******************
 FLOW PROCESS FROM NODE 11416.00 TO NODE 11426.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1140.00 DOWNSTREAM ELEVATION (FEET) = 1139.00
 STREET LENGTH (FEET) = 1350.81 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 490.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 2.04
   HALFSTREET FLOOD WIDTH (FEET) = 107.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.73
 STREET FLOW TRAVEL TIME (MIN.) = 9.73 Tc (MIN.) = 33.12
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.786
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                      B 3.95 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.245
 SUBAREA AREA (ACRES) = 5.56 SUBAREA RUNOFF (CFS) = 8.02
 EFFECTIVE AREA(ACRES) = 261.15 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) =
                    294.6
                                 PEAK FLOW RATE (CFS) = 486.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.15
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 2.04 HALFSTREET FLOOD WIDTH(FEET) = 107.60
 FLOW VELOCITY (FEET/SEC.) = 2.31 DEPTH*VELOCITY (FT*FT/SEC.) = 4.70
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
```

File name: LR0114ZZ.RES

Page 16

Date: 04/21/2014

EFFECTIVE AREA(ACRES) = 255.59 AREA-AVERAGED Fm(INCH/HR) = 0.11

Date: 04/21/2014 File name: LR0114ZZ.RES Page 15

```
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 87.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.08
 PIPE-FLOW(CFS) = 457.91
 PIPEFLOW TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 25.42
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.093
 SUBAREA AREA(ACRES) = 5.56 SUBAREA RUNOFF(CFS) = 9.56
 TOTAL AREA (ACRES) = 294.6
                            PEAK FLOW RATE (CFS) = 486.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.15
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 28.08
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH (FEET) = 0.94 FLOOD WIDTH (FEET) = 52.58
   FULL HALF-STREET VELOCITY (FEET/SEC.) = 1.12
   SPLIT DEPTH(FEET) = 0.74 SPLIT FLOOD WIDTH(FEET) = 33.12
   SPLIT FLOW(CFS) = 8.71 SPLIT VELOCITY(FEET/SEC.) = 0.98
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 52.58
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.12
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.05
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11426.00 = 8580.97 FEET.
******************
 FLOW PROCESS FROM NODE 11426.00 TO NODE 11426.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.42
 RAINFALL INTENSITY (INCH/HR) = 2.09
 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 261.15
 TOTAL STREAM AREA(ACRES) = 294.64
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 486.00
******************
 FLOW PROCESS FROM NODE 11420.00 TO NODE 11421.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 734.43
 ELEVATION DATA: UPSTREAM(FEET) = 1175.00 DOWNSTREAM(FEET) = 1165.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.056
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.650
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                       Fρ
                                                      SCS Tc
                                               Αр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
       Date: 04/21/2014 File name: LR0114ZZ.RES
                                                     Page 17
```

```
B 8.59 0.75 0.100
                                                       56 10.06
 COMMERCIAL
 RESIDENTIAL
                        B 0.65 0.75 0.600 56 13.63
 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.135
 SUBAREA RUNOFF (CFS) = 29.52
 TOTAL AREA (ACRES) = 9.24 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 11421.00 TO NODE 11422.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1165.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1162.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 254.96
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.17000
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.541
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fр
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                      В
                              7.12
                                       0.75
                                                0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.54 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.135
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.10
 AVERAGE FLOW DEPTH (FEET) = 1.00 FLOOD WIDTH (FEET) = 10.65
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.52 Tc (MIN.) = 10.58
 SUBAREA AREA (ACRES) = 7.66 SUBAREA RUNOFF (CFS) = 23.71
 EFFECTIVE AREA(ACRES) = 16.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA(ACRES) = 16.9 PEAK FLOW RATE(CFS) =
                                                         52.32
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 ** PIPE SIZED TO MAXIMIZE V-GUTTER FLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 12.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.75
 PIPE-FLOW(CFS) =
                   29.52
 PIPEFLOW TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 10.28
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.602
 SUBAREA AREA (ACRES) = 7.66 SUBAREA RUNOFF (CFS) = 24.13
 EFFECTIVE AREA(ACRES) = 16.90 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.51 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 16.9
                                                         53.25
                               PEAK FLOW RATE(CFS) =
 V-GUTTER HYDRAULICS BASED ON MAINLINE TC :
 V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 23.73
 END OF SUBAREA "V" GUTTER HYDRAULICS:
```

```
DEPTH (FEET) = 0.84 FLOOD WIDTH (FEET) = 8.82
                                                                                                         B 11.92 0.75 0.100
                                                                                 COMMERCIAL
                                                                                                                                         56
 FLOW VELOCITY (FEET/SEC.) = 6.60 DEPTH*VELOCITY (FT*FT/SEC) = 5.57
                                                                                 RESIDENTIAL
                                                                                                        B 0.89 0.75 0.600
 LONGEST FLOWPATH FROM NODE 11420.00 TO NODE 11422.00 = 989.39 FEET.
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                                                         56
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
******************
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.135
 FLOW PROCESS FROM NODE 11422.00 TO NODE 11423.00 IS CODE = 92
                                                                                 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 89.49
                                                                                 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.83
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                                 AVERAGE FLOW DEPTH(FEET) = 0.88 FLOOD WIDTH(FEET) = 64.91
_____
                                                                                 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 13.37
 UPSTREAM NODE ELEVATION (FEET) = 1162.00
                                                                                 SUBAREA AREA(ACRES) = 12.81
                                                                                                                SUBAREA RUNOFF (CFS) = 34.31
                                                                                 EFFECTIVE AREA(ACRES) = 37.89 AREA-AVERAGED Fm(INCH/HR) = 0.10
 DOWNSTREAM NODE ELEVATION (FEET) = 1160.00
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.16
 CHANNEL LENGTH THRU SUBAREA (FEET) = 285.52
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                 TOTAL AREA(ACRES) = 37.9
                                                                                                                 PEAK FLOW RATE (CFS) = 101.47
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.306
                                                                                 END OF SUBAREA "V" GUTTER HYDRAULICS:
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 DEPTH(FEET) = 0.91 FLOOD WIDTH(FEET) = 68.34
                                        Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.95 DEPTH*VELOCITY (FT*FT/SEC) = 4.48
     LAND USE
 COMMERCIAL
                      В
                                7.62
                                         0.75
                                                0.100
                                                                                 LONGEST FLOWPATH FROM NODE 11420.00 TO NODE 11424.00 = 1712.91 FEET.
 RESIDENTIAL
                                                                                ******************
 "3-4 DWELLINGS/ACRE" B
                               0.56
                                        0.75
                                                0.600
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 FLOW PROCESS FROM NODE 11424.00 TO NODE 11425.00 IS CODE = 92
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
                                                                                 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.72
                                                                                ______
 AVERAGE FLOW DEPTH(FEET) = 0.86 FLOOD WIDTH(FEET) = 62.97
                                                                                 UPSTREAM NODE ELEVATION (FEET) = 1155.00
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 11.86
                                                                                 DOWNSTREAM NODE ELEVATION (FEET) = 1150.00
 SUBAREA AREA(ACRES) = 8.18
                                SUBAREA RUNOFF (CFS) = 23.60
                                                                                 CHANNEL LENGTH THRU SUBAREA (FEET) = 584.00
                                                                                 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 EFFECTIVE AREA(ACRES) = 25.08 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.57 AREA-AVERAGED Ap = 0.18
                                                                                 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 TOTAL AREA(ACRES) = 25.1
                                PEAK FLOW RATE(CFS) =
                                                          72.35
                                                                                 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 MAXIMUM DEPTH(FEET) = 1.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.818
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                        SCS
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                     LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 DEPTH(FEET) = 0.88 FLOOD WIDTH(FEET) = 65.80
                                                                                 COMMERCIAL
                                                                                                       В
                                                                                                               15.83 0.75
                                                                                                                                 0.100
 FLOW VELOCITY (FEET/SEC.) = 3.80 DEPTH*VELOCITY (FT*FT/SEC) = 3.36
                                                                                 RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 11420.00 TO NODE 11423.00 = 1274.91 FEET.
                                                                                 "3-4 DWELLINGS/ACRE" B 1.17 0.75
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
********************
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
 FLOW PROCESS FROM NODE 11423.00 TO NODE 11424.00 IS CODE = 92
                                                                                 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.25
                                                                                 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.63
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                                 AVERAGE FLOW DEPTH(FEET) = 0.99 FLOOD WIDTH(FEET) = 77.90
_____
                                                                                 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.10 Tc (MIN.) = 15.48
 UPSTREAM NODE ELEVATION (FEET) = 1160.00
                                                                                 SUBAREA AREA(ACRES) = 17.00
                                                                                                                SUBAREA RUNOFF (CFS) = 41.58
 DOWNSTREAM NODE ELEVATION (FEET) = 1155.00
                                                                                 EFFECTIVE AREA(ACRES) = 54.89
                                                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.10
 CHANNEL LENGTH THRU SUBAREA (FEET) = 438.00
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.15
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                 TOTAL AREA(ACRES) = 54.9
                                                                                                                 PEAK FLOW RATE(CFS) =
                                                                                                                                          134.25
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.077
                                                                                 ** PIPE SIZED TO MAXIMIZE V-GUTTER FLOW AT DOWNSTREAM NODE **
                                                                                 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                        Fρ
                                                        SCS
                                                                                 ASSUME FULL-FLOWING PIPELINE
                                                 Αp
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.96
```

Page 19

Date: 04/21/2014

File name: LR011477.RFS

Page 20

Date: 04/21/2014 File name: LR0114ZZ.RES

```
PIPE-FLOW(CFS) = 50.20
                                                                             _____
 PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 13.98
                                                                              TOTAL NUMBER OF STREAMS = 2
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.995
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 SUBAREA AREA(ACRES) = 17.00 SUBAREA RUNOFF(CFS) = 44.29
                                                                              TIME OF CONCENTRATION (MIN.) = 17.61
 EFFECTIVE AREA(ACRES) = 54.89 AREA-AVERAGED Fm(INCH/HR) = 0.10
                                                                              RAINFALL INTENSITY (INCH/HR) = 2.61
 AREA-AVERAGED Fp(INCH/HR) = 0.52 AREA-AVERAGED Ap = 0.20
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.10
 TOTAL AREA (ACRES) = 54.9
                              PEAK FLOW RATE (CFS) = 143.00
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.56
 V-GUTTER HYDRAULICS BASED ON MAINLINE Tc :
                                                                              AREA-AVERAGED Ap = 0.18
 V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 92.80
                                                                              EFFECTIVE STREAM AREA(ACRES) = 72.15
                                                                              TOTAL STREAM AREA(ACRES) = 72.15
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 162.68
 DEPTH(FEET) = 0.92 FLOOD WIDTH(FEET) = 69.84
 FLOW VELOCITY (FEET/SEC.) = 4.34 DEPTH*VELOCITY (FT*FT/SEC) = 3.99
                                                                              ** CONFLUENCE DATA **
 LONGEST FLOWPATH FROM NODE 11420.00 TO NODE 11425.00 = 2296.91 FEET.
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                               NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
******************
                                                                               1 486.00 25.42 2.093 0.75(0.11) 0.14 261.2 11400.00
 FLOW PROCESS FROM NODE 11425.00 TO NODE 11426.00 IS CODE = 92
                                                                                1 462.38 32.77 1.797 0.75(0.11) 0.14 294.6 11410.00
                                                                                       162.68 17.61 2.608 0.56(0.10) 0.18 72.2 11420.00
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
                                                                              RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 UPSTREAM NODE ELEVATION (FEET) = 1150.00
                                                                              CONFLUENCE FORMULA USED FOR 2 STREAMS.
 DOWNSTREAM NODE ELEVATION (FEET) = 1139.00
                                                                              ** PEAK FLOW RATE TABLE **
 CHANNEL LENGTH THRU SUBAREA (FEET) = 770.03
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                               NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                1
                                                                                       586.80 17.61 2.608 0.68(0.11) 0.15 253.1 11420.00
                                                                                       615.22 25.42 2.093 0.70(0.11) 0.15 333.3 11400.00
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.608
                                                                                       572.38 32.77 1.797 0.70(0.11) 0.15 366.8 11410.00
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              PEAK FLOW RATE (CFS) = 615.22 Tc (MIN.) = 25.42
 RESIDENTIAL
                                                                              EFFECTIVE AREA(ACRES) = 333.30 AREA-AVERAGED Fm(INCH/HR) = 0.11
                    В
 "3-4 DWELLINGS/ACRE"
                            1.58
                                       0.75
                                              0.600 56
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.15
 COMMERCIAL
                      В
                             15.68 0.75 0.100 56
                                                                              TOTAL AREA (ACRES) = 366.8
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11426.00 = 8580.97 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.146
                                                                             ******************
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 162.41
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.01
                                                                              FLOW PROCESS FROM NODE 11426.00 TO NODE 11436.00 IS CODE = 63
 AVERAGE FLOW DEPTH(FEET) = 0.99 FLOOD WIDTH(FEET) = 78.80
                                                                             ______
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.14 Tc (MIN.) = 17.61
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AREA(ACRES) = 17.26 SUBAREA RUNOFF(CFS) = 38.82
                                                                             >>>> (STREET TABLE SECTION # 14 USED) <<<<
 EFFECTIVE AREA(ACRES) = 72.15 AREA-AVERAGED Fm(INCH/HR) = 0.10
                                                                             ______
 AREA-AVERAGED Fp (INCH/HR) = 0.56 AREA-AVERAGED Ap = 0.18
                                                                              UPSTREAM ELEVATION(FEET) = 1139.00 DOWNSTREAM ELEVATION(FEET) = 1138.00
 TOTAL AREA (ACRES) = 72.2 PEAK FLOW RATE (CFS) = 162.68
                                                                              STREET LENGTH (FEET) = 1323.13 CURB HEIGHT (INCHES) = 8.0
                                                                              STREET HALFWIDTH (FEET) = 39.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.92; 6HR = 2.53; 24HR = 5.50
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DEPTH(FEET) = 0.99 FLOOD WIDTH(FEET) = 78.80
 FLOW VELOCITY (FEET/SEC.) = 6.02 DEPTH*VELOCITY (FT*FT/SEC) = 5.98
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 LONGEST FLOWPATH FROM NODE 11420.00 TO NODE 11426.00 = 3066.94 FEET.
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 11426.00 TO NODE 11426.00 IS CODE = 1
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 619.04
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0114ZZ.RES Page 21

Date: 04/21/2014 File name: LR0114ZZ.RES

Page 22

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 2.22
   HALFSTREET FLOOD WIDTH (FEET) = 116.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.48
 STREET FLOW TRAVEL TIME (MIN.) = 8.92 Tc (MIN.) = 34.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.747
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 1.61 0.75 0.600 56
 COMMERCIAL
                       B 3.83 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.248
 SUBAREA AREA(ACRES) = 5.44 SUBAREA RUNOFF(CFS) = 7.65
 EFFECTIVE AREA(ACRES) = 338.74 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.15
 TOTAL AREA (ACRES) = 372.2 PEAK FLOW RATE (CFS) = 615.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.97; 6HR = 2.64; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 2.21 HALFSTREET FLOOD WIDTH(FEET) = 116.21
 FLOW VELOCITY (FEET/SEC.) = 2.47 DEPTH*VELOCITY (FT*FT/SEC.) = 5.46
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.71
 PIPE-FLOW(CFS) = 552.75
 PIPEFLOW TRAVEL TIME (MIN.) = 1.88 Tc (MIN.) = 27.30
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.005
 SUBAREA AREA (ACRES) = 5.44 SUBAREA RUNOFF (CFS) = 8.91
 TOTAL AREA(ACRES) = 372.2 PEAK FLOW RATE(CFS) = 615.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.97; 6HR = 2.64; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 62.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.05
   HALFSTREET FLOOD WIDTH (FEET) = 58.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.39
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11436.00 = 9904.10 FEET.
FLOW PROCESS FROM NODE 11436.00 TO NODE 11436.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
```

```
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.30
 RAINFALL INTENSITY (INCH/HR) = 2.00
 AREA-AVERAGED Fm(INCH/HR) = 0.11
 AREA-AVERAGED Fp (INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.15
 EFFECTIVE STREAM AREA(ACRES) = 338.74
 TOTAL STREAM AREA(ACRES) = 372.23
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 615.22
******************
 FLOW PROCESS FROM NODE 11430.00 TO NODE 11431.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 912.51
 ELEVATION DATA: UPSTREAM(FEET) = 1172.00 DOWNSTREAM(FEET) = 1168.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.760
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.024
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                     SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.87 0.75 0.600 56 18.65
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      B
                             5.10 0.63 1.000 65 31.95
 COMMERCIAL
                       В
                               3.66 0.75 0.100 56 13.76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.622
 SUBAREA RUNOFF(CFS) = 22.72
 TOTAL AREA(ACRES) = 9.63 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 11431.00 TO NODE 11432.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1168.00 DOWNSTREAM ELEVATION(FEET) = 1166.00
 STREET LENGTH (FEET) = 292.62 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

File name: LR0114ZZ.RES

Page 24

Date: 04/21/2014

Date: 04/21/2014 File name: LR0114ZZ.RES Page 23

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.45 STREET FLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 16.91 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.672 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE AGRICULTURAL FAIR COVER В 5.29 0.63 "ORCHARDS" 1.000 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600 B 3.68 0.75 0.100 56 COMMERCIAL SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.629 SUBAREA AREA (ACRES) = 9.42 SUBAREA RUNOFF (CFS) = 19.23 EFFECTIVE AREA(ACRES) = 29.05 AREA-AVERAGED Fm(INCH/HR) = 0.41 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.64 TOTAL AREA (ACRES) = 29.1 PEAK FLOW RATE (CFS) = 59.16 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 30.84 FLOW VELOCITY (FEET/SEC.) = 3.62 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.61 LONGEST FLOWPATH FROM NODE 11430.00 TO NODE 11433.00 = 1487.13 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11433.00 TO NODE 11434.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 13 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1163.00 DOWNSTREAM ELEVATION(FEET) = 1155.00 STREET LENGTH (FEET) = 460.52 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.40 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.72HALFSTREET FLOOD WIDTH (FEET) = 30.53 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.60 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.30 STREET FLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 18.58 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.526 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN AGRICULTURAL FAIR COVER Date: 04/21/2014 File name: LR0114ZZ.RES Page 26

Date: 04/21/2014 File name: LR0114ZZ.RES Page 25

AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.53

"ORCHARDS" B 9.40 0.63 1.000 65	SUBAREA AREA(ACRES) = 19.91 SUBAREA RUNOFF(CFS) = 34.39
RESIDENTIAL	EFFECTIVE AREA(ACRES) = 65.02 AREA-AVERAGED Fm(INCH/HR) = 0.41
"3-4 DWELLINGS/ACRE" B 0.77 0.75 0.600 56	AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.64
COMMERCIAL B 5.89 0.75 0.100 56	TOTAL AREA(ACRES) = 65.0 PEAK FLOW RATE(CFS) = 112.39
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64	
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.651	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
SUBAREA AREA (ACRES) = 16.06 SUBAREA RUNOFF(CFS) = 30.47	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
EFFECTIVE AREA(ACRES) = 45.11 AREA-AVERAGED Fm(INCH/HR) = 0.41	
AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.64	END OF SUBAREA STREET FLOW HYDRAULICS:
TOTAL AREA (ACRES) = 45.1 PEAK FLOW RATE (CFS) = 85.80	DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 42.88
	FLOW VELOCITY (FEET/SEC.) = 3.91 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50	AND L = $597.5$ FT WITH ELEVATION-DROP = $5.0$ FT, IS $57.4$ CFS,
	WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11435.00
END OF SUBAREA STREET FLOW HYDRAULICS:	LONGEST FLOWPATH FROM NODE 11430.00 TO NODE 11435.00 = 2545.16 FEET.
DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 33.50	
FLOW VELOCITY (FEET/SEC.) = 4.75 DEPTH*VELOCITY (FT*FT/SEC.) = 3.55	******************
LONGEST FLOWPATH FROM NODE 11430.00 TO NODE 11434.00 = 1947.65 FEET.	FLOW PROCESS FROM NODE 11435.00 TO NODE 11436.00 IS CODE = 63
20.1022 220.1111 2101 1022 22.100,000 20 1022 22.100.100	
****************	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM NODE 11434.00 TO NODE 11435.00 IS CODE = 63	>>>> (STREET TABLE SECTION # 13 USED) <<<<
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	UPSTREAM ELEVATION(FEET) = 1150.00 DOWNSTREAM ELEVATION(FEET) = 1138.00
>>>> (STREET TABLE SECTION # 13 USED) <<<<	STREET LENGTH(FEET) = 744.00 CURB HEIGHT(INCHES) = 8.0
	STREET HALFWIDTH(FEET) = 32.00
UPSTREAM ELEVATION(FEET) = 1155.00 DOWNSTREAM ELEVATION(FEET) = 1150.00	
STREET LENGTH(FEET) = 597.51 CURB HEIGHT(INCHES) = 8.0	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00
STREET HALFWIDTH(FEET) = 32.00	INSIDE STREET CROSSFALL(DECIMAL) = 0.020
	OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00	
INSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
	Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020	MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.01
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	100000000000000000000000000000000000000
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 130.45
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07	***STREET FLOWING FULL***
	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.00	STREET FLOW DEPTH(FEET) = 0.85
***STREET FLOWING FULL***	HALFSTREET FLOOD WIDTH (FEET) = 40.93
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.12
STREET FLOW DEPTH(FEET) = 0.86	PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
HALFSTREET FLOOD WIDTH (FEET) = 41.90	STREET FLOW TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 23.62
AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.80	* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.187
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.29	SUBAREA LOSS RATE DATA (AMC II):
STREET FLOW TRAVEL TIME (MIN.) = 2.62 Tc (MIN.) = 21.20	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.334	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
SUBAREA LOSS RATE DATA (AMC II):	AGRICULTURAL FAIR COVER
	"ORCHARDS" B 13.26 0.63 1.000 65
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	RESIDENTIAL
AGRICULTURAL FAIR COVER	"3-4 DWELLINGS/ACRE" B 2.17 0.75 0.600 56
"ORCHARDS" B 11.52 0.63 1.000 65	COMMERCIAL B 7.43 0.75 0.100 56
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
	SUBAREA AREA (ACRES) = 22.86 SUBAREA RUNOFF (CFS) = 36.10
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64	EFFECTIVE AREA (ACRES) = 87.88 AREA-AVERAGED Fm (INCH/HR) = 0.42
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645	AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.65

Date: 04/21/2014 File name: LR0114ZZ.RES Page 27 Date: 04/21/2014 File name: LR0114ZZ.RES Page 28

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1138.00 DOWNSTREAM ELEVATION(FEET) = 1120.00
 STREET LENGTH (FEET) = 1425.88 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.47
   HALFSTREET FLOOD WIDTH (FEET) = 79.16
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.43
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.92
 STREET FLOW TRAVEL TIME (MIN.) = 3.20 Tc (MIN.) = 26.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.027
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                        B
                               2.47 0.75 0.600
                                                           56
 SCHOOL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.12
                                           0.75
                                                   0.600
                                                            56
 COMMERCIAL
                         B 12.47
                                           0.75
                                                   0.100
                                                           56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                          В
                               33.73 0.63 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.746
 SUBAREA AREA(ACRES) = 49.79
                                SUBAREA RUNOFF(CFS) = 69.40
 EFFECTIVE AREA(ACRES) = 438.55 AREA-AVERAGED Fm(INCH/HR) = 0.21
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.32
 TOTAL AREA(ACRES) = 509.9 PEAK FLOW RATE(CFS) =
                                                           741.72
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.45 HALFSTREET FLOOD WIDTH(FEET) = 78.12
 FLOW VELOCITY (FEET/SEC.) = 7.33 DEPTH*VELOCITY (FT*FT/SEC.) = 10.61
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 34.52
       Date: 04/21/2014
```

FLOW PROCESS FROM NODE 11436.00 TO NODE 11437.00 IS CODE = 63

```
PIPE-FLOW(CFS) = 612.20
 PIPEFLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 24.31
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.150
 SUBAREA AREA (ACRES) = 49.79 SUBAREA RUNOFF (CFS) = 74.92
 TOTAL AREA (ACRES) = 509.9
                               PEAK FLOW RATE (CFS) = 764.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 152.78
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH (FEET) = 0.94 FLOOD WIDTH (FEET) = 52.58
   FULL HALF-STREET VELOCITY (FEET/SEC.) = 4.64
   SPLIT DEPTH(FEET) = 0.91 SPLIT FLOOD WIDTH(FEET) = 50.00
   SPLIT FLOW(CFS) = 72.79 SPLIT VELOCITY(FEET/SEC.) = 4.57
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 52.58
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.35
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          750.14 20.18 2.403 0.66(0.21)0.33 380.9 11420.00
          764.99 24.31 2.150 0.66(0.21)0.32
                                                438.6 11430.00
          759.75 27.99 1.975 0.66(0.20) 0.31
                                                476.4 11400.00
     3
           697.20 35.39 1.716 0.67 (0.20) 0.30
                                                509.9 11410.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 764.99 Tc (MIN.) = 24.31
 AREA-AVERAGED Fm(INCH/HR) = 0.21 AREA-AVERAGED Fp(INCH/HR) = 0.66
 AREA-AVERAGED Ap = 0.32 EFFECTIVE AREA(ACRES) = 438.55
 LONGEST FLOWPATH FROM NODE 11400.00 TO NODE 11437.00 = 11329.98 FEET.
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) =
                       509.9 \text{ TC}(MIN.) = 24.31
 EFFECTIVE AREA(ACRES) = 438.55 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.333
                       764.99
 PEAK FLOW RATE(CFS) =
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          750.14 20.18 2.403 0.66(0.21)0.33 380.9 11420.00
          764.99 24.31 2.150 0.66(0.21) 0.32 438.6 11430.00
          759.75 27.99 1.975 0.66(0.20) 0.31
                                                476.4 11400.00
          697.20 35.39 1.716 0.67 (0.20) 0.30
                                                509.9 11410.00
```

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0114ZZ.RES Page 31 Date: 04/21/2014 File name: LR0114ZZ.RES Page 32

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 11518 (FILE LR0115ZZ)

\* 100-YR HC ULTIMATE CONDITION OCTOBER 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0115ZZ.DAT

TIME/DATE OF STUDY: 17:11 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

#### --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 9 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 2.00 0.0312 0.167 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 1.5 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 11500.00 TO NODE 11501.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 700.38 ELEVATION DATA: UPSTREAM(FEET) = 1139.00 DOWNSTREAM(FEET) = 1137.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.486 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.061 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" 0.43 0.75 0.600 56 18.28 COMMERCIAL В 4.01 0.75 0.100 56 13.49 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.148 SUBAREA RUNOFF (CFS) = 11.79TOTAL AREA (ACRES) = 4.44 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.27 FLOW PROCESS FROM NODE 11501.00 TO NODE 11502.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1137.00 DOWNSTREAM NODE ELEVATION (FEET) = 1135.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 682.28 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150Date: 04/21/2014 File name: LR011577.RFS Page 2

File name: LR0115ZZ.RES Date: 04/21/2014 Page 1

```
PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.480
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                        Fρ
                                                 Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                3.90
 COMMERCIAL
                       В
                                         0.75
                                                 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.84 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.78
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.01
 AVERAGE FLOW DEPTH(FEET) = 0.69 FLOOD WIDTH(FEET) = 42.65
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 5.67 Tc (MIN.) = 19.16
 SUBAREA AREA(ACRES) = 4.74
                                SUBAREA RUNOFF(CFS) = 9.98
 EFFECTIVE AREA(ACRES) = 9.18 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA(ACRES) = 9.2 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.71 FLOOD WIDTH(FEET) = 45.49
 FLOW VELOCITY (FEET/SEC.) = 2.06 DEPTH*VELOCITY (FT*FT/SEC) = 1.47
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11502.00 = 1382.66 FEET.
******************
 FLOW PROCESS FROM NODE 11502.00 TO NODE 11503.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1135.00 DOWNSTREAM ELEVATION(FEET) = 1130.00
 STREET LENGTH (FEET) = 607.75 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92
 STREET FLOW TRAVEL TIME (MIN.) = 3.44 Tc (MIN.) = 22.59
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.246
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
```

```
LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                            17.51
                                        0.75
                                                0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 0.51 0.75 0.600
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.114
 SUBAREA AREA(ACRES) = 18.02
                              SUBAREA RUNOFF (CFS) = 35.04
 EFFECTIVE AREA(ACRES) = 27.20 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 TOTAL AREA (ACRES) = 27.2 PEAK FLOW RATE (CFS) =
                                                         52.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.14
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.72 HALFSTREET FLOOD WIDTH (FEET) = 30.94
 FLOW VELOCITY (FEET/SEC.) = 3.20 DEPTH*VELOCITY (FT*FT/SEC.) = 2.31
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 607.8 FT WITH ELEVATION-DROP = 5.0 FT, IS 56.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11503.00
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11503.00 = 1990.41 FEET.
FLOW PROCESS FROM NODE 11503.00 TO NODE 11504.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1130.00 DOWNSTREAM ELEVATION(FEET) = 1115.00
 STREET LENGTH (FEET) = 1118.01 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   83.90
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 35.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.28
 STREET FLOW TRAVEL TIME (MIN.) = 4.39 Tc (MIN.) = 26.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.019
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                                αA
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                              33.83
                                        0.75
                                               0.100
 COMMERCIAL
                      В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.43 0.75 0.600
                                                        56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0115ZZ.RES Page 3

File name: LR0115ZZ.RES Page 4

```
SUBAREA AREA (ACRES) = 36.26 SUBAREA RUNOFF (CFS) = 62.64
 EFFECTIVE AREA(ACRES) = 63.46 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 TOTAL AREA(ACRES) = 63.5
                             PEAK FLOW RATE (CFS) = 109.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.09
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 42.19
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 3.71
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1118.0 FT WITH ELEVATION-DROP = 15.0 FT, IS 104.2 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 11504.00
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11504.00 = 3108.42 FEET.
******************
 FLOW PROCESS FROM NODE 11504.00 TO NODE 11505.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
ELEVATION DATA: UPSTREAM(FEET) = 1115.00 DOWNSTREAM(FEET) = 1114.00
 FLOW LENGTH (FEET) = 1297.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 56.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 4.46
 ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 109.64
 PIPE TRAVEL TIME (MIN.) = 4.84 Tc (MIN.) = 31.82
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11505.00 = 4405.42 FEET.
FLOW PROCESS FROM NODE 11505.00 TO NODE 11505.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 31.82
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.829
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Ap SCS
                                   Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                   0.75 0.100 56
 COMMERCIAL
                            33.83
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.43
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
 SUBAREA AREA(ACRES) = 36.26 SUBAREA RUNOFF(CFS) = 56.42
 EFFECTIVE AREA(ACRES) = 99.72 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 TOTAL AREA (ACRES) = 99.7 PEAK FLOW RATE (CFS) = 155.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.09
FLOW PROCESS FROM NODE 11505.00 TO NODE 11506.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1114.00 DOWNSTREAM(FEET) = 1102.00
 FLOW LENGTH (FEET) = 1304.00 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.36
 ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 155.18
 PIPE TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 33.58
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11506.00 = 5709.42 FEET.
******************
 FLOW PROCESS FROM NODE 11506.00 TO NODE 11506.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 33.58
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.771
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                Fρ
                                                SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                   B 88.90 0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.95 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.146
 SUBAREA AREA(ACRES) = 97.85 SUBAREA RUNOFF(CFS) = 146.34
 EFFECTIVE AREA(ACRES) = 197.57 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA(ACRES) = 197.6
                            PEAK FLOW RATE(CFS) =
                                                296.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
***********************
 FLOW PROCESS FROM NODE 11506.00 TO NODE 11506.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 33.58
 RAINFALL INTENSITY (INCH/HR) = 1.77
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.14
 EFFECTIVE STREAM AREA(ACRES) = 197.57
 TOTAL STREAM AREA(ACRES) = 197.57
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                             296.31
******************
 FLOW PROCESS FROM NODE 11505.10 TO NODE 11505.20 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1008.46
 ELEVATION DATA: UPSTREAM(FEET) = 1120.00 DOWNSTREAM(FEET) = 1117.00
```

>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<

Date: 04/21/2014 File name: LR0115ZZ.RES Page 5

Date: 04/21/2014 File name: LR0115ZZ.RES Page 6

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                           >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.475
                                                                           >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
                                                                          _____
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.818
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1115.00 DOWNSTREAM(FEET) = 1102.00
                                           Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                           FLOW LENGTH (FEET) = 1260.00 MANNING'S N = 0.013
                                                                           DEPTH OF FLOW IN 33.0 INCH PIPE IS 26.7 INCHES
     LAND HSE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL
                    в 8.34
                                     0.75
                                             0.100 56 15.48
                                                                           PIPE-FLOW VELOCITY(FEET/SEC.) = 9.51
                                                                           ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.08 0.75 0.600 56 20.97
                                                                           PIPE-FLOW(CFS) =
                                                                                          48.85
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           PIPE TRAVEL TIME (MIN.) = 2.21 Tc (MIN.) = 23.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.157
                                                                           LONGEST FLOWPATH FROM NODE 11505.10 TO NODE 11506.00 = 3040.18 FEET.
 SUBAREA RUNOFF (CFS) = 22.90
                                                                          ******************
 TOTAL AREA(ACRES) = 9.42 PEAK FLOW RATE(CFS) =
                                                                           FLOW PROCESS FROM NODE 11506.00 TO NODE 11506.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          ______
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          ______
******************
                                                                           MAINLINE Tc(MIN.) = 23.43
 FLOW PROCESS FROM NODE 11505.20 TO NODE 11505.30 IS CODE = 92
                                                                           * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.197
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
_____
                                                                               LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 UPSTREAM NODE ELEVATION (FEET) = 1117.00
                                                                           COMMERCIAL
                                                                                              B 24.06 0.75 0.100
 DOWNSTREAM NODE ELEVATION (FEET) = 1115.00
                                                                           RESIDENTIAL
 CHANNEL LENGTH THRU SUBAREA (FEET) = 771.72
                                                                           "3-4 DWELLINGS/ACRE" B 0.94 0.75 0.600
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.119
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                           SUBAREA AREA (ACRES) = 25.00 SUBAREA RUNOFF (CFS) = 47.44
                                                                           EFFECTIVE AREA(ACRES) = 49.35 AREA-AVERAGED Fm(INCH/HR) = 0.10
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.332
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           TOTAL AREA (ACRES) = 49.3 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            qΑ
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 COMMERCIAL
                    в 14.19
                                     0.75 0.100 56
                                                                           5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 RESIDENTIAL
                                                                          ***********************
 "3-4 DWELLINGS/ACRE" B 0.74
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           FLOW PROCESS FROM NODE 11506.00 TO NODE 11506.00 IS CODE = 1
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.125
                                                                          ______
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.89
                                                                           >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.24
                                                                          >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 AVERAGE FLOW DEPTH(FEET) = 0.85 FLOOD WIDTH(FEET) = 61.92
                                                                         _______
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 5.75 Tc (MIN.) = 21.22
                                                                           TOTAL NUMBER OF STREAMS = 2
 SUBAREA AREA(ACRES) = 14.93 SUBAREA RUNOFF(CFS) = 30.08
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 EFFECTIVE AREA(ACRES) = 24.35 AREA-AVERAGED Fm(INCH/HR) = 0.10
                                                                           TIME OF CONCENTRATION (MIN.) = 23.43
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
                                                                           RAINFALL INTENSITY (INCH/HR) = 2.20
 TOTAL AREA(ACRES) = 24.3 PEAK FLOW RATE(CFS) =
                                                      48.85
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.10
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           AREA-AVERAGED Ap = 0.13
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                           EFFECTIVE STREAM AREA(ACRES) = 49.35
                                                                           TOTAL STREAM AREA(ACRES) = 49.35
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE = 93.35
 DEPTH(FEET) = 0.91 FLOOD WIDTH(FEET) = 68.64
 FLOW VELOCITY (FEET/SEC.) = 2.36 DEPTH*VELOCITY (FT*FT/SEC) = 2.15
                                                                           ** CONFLUENCE DATA **
 LONGEST FLOWPATH FROM NODE 11505.10 TO NODE 11505.30 = 1780.18 FEET.
                                                                           STREAM Q To Intensity Fp(Fm) Ap Ae
                                                                           NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                      (ACRES) NODE
1
                                                                                    296.31 33.58 1.771 0.75 (0.10) 0.14 197.6 11500.00
 FLOW PROCESS FROM NODE 11505.30 TO NODE 11506.00 IS CODE = 31
                                                                                    93.35 23.43 2.197 0.75(0.10) 0.13 49.3 11505.10
```

Page 7

Date: 04/21/2014

File name: LR0115ZZ.RES

Date: 04/21/2014 File name: LR0115ZZ.RES Page 8

56

93.35

HEADWATER

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

```
** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
         353.05 23.43 2.197 0.75(0.10) 0.14 187.2 11505.10
   1
         370.70 33.58 1.771 0.75(0.10) 0.14 246.9 11500.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 370.70 Tc (MIN.) = 33.58
 EFFECTIVE AREA(ACRES) = 246.92 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) =
                  246.9
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11506.00 = 5709.42 FEET.
FLOW PROCESS FROM NODE 11506.00 TO NODE 11507.00 IS CODE = 31
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1102.00 DOWNSTREAM(FEET) = 1090.00
 FLOW LENGTH (FEET) = 1102.97 MANNING'S N = 0.013
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 53.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.32
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 370.70
 PIPE TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 34.71
 LONGEST FLOWPATH FROM NODE 11500.00 TO NODE 11507.00 = 6812.39 FEET.
******************
 FLOW PROCESS FROM NODE 11507.00 TO NODE 11507.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 34.71
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.736
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                         Аp
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    B 7.60 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.36
                                 0.75
                                          0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.123
 SUBAREA AREA(ACRES) = 7.96 SUBAREA RUNOFF(CFS) = 11.78
 EFFECTIVE AREA(ACRES) = 254.88 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 254.9
                           PEAK FLOW RATE(CFS) =
                                                 374.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
*****************
 FLOW PROCESS FROM NODE 11508.00 TO NODE 11509.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 682.62
 ELEVATION DATA: UPSTREAM(FEET) = 1140.00 DOWNSTREAM(FEET) = 1139.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.254
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.843
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                              Аp
                                                      SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                             0.41 0.75
                                               0.600
                                                       56 20.67
 COMMERCIAL
                        В
                              1.89 0.75 0.100 56 15.25
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
 SUBAREA RUNOFF (CFS) = 5.59
 TOTAL AREA (ACRES) = 2.30 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
*************************
 FLOW PROCESS FROM NODE 11509.00 TO NODE 11510.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
UPSTREAM NODE ELEVATION (FEET) = 1139.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1138.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 621.80
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.282
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                      SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     в 9.23 0.75
                                               0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.20 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.111
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 1.53
 AVERAGE FLOW DEPTH(FEET) = 0.71 FLOOD WIDTH(FEET) = 45.94
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 6.75 Tc (MIN.) = 22.01
 SUBAREA AREA (ACRES) = 9.43 SUBAREA RUNOFF (CFS) = 18.66
 EFFECTIVE AREA(ACRES) = 11.73 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 TOTAL AREA (ACRES) = 11.7 PEAK FLOW RATE (CFS) =
                                                         23.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.80 FLOOD WIDTH(FEET) = 55.65
       Date: 04/21/2014 File name: LR0115ZZ.RES
                                                     Page 10
```

Date: 04/21/2014 File name: LR0115ZZ.RES Page 9

```
FLOW VELOCITY (FEET/SEC.) = 1.67 DEPTH*VELOCITY (FT*FT/SEC) = 1.33
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11510.00 = 1304.42 FEET.
FLOW PROCESS FROM NODE 11510.00 TO NODE 11511.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
ELEVATION DATA: UPSTREAM(FEET) = 1138.00 DOWNSTREAM(FEET) = 1135.00
 FLOW LENGTH (FEET) = 352.20 MANNING'S N = 0.013
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 19.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.47
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 23.09
 PIPE TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 22.79
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11511.00 = 1656.62 FEET.
******************
 FLOW PROCESS FROM NODE 11511.00 TO NODE 11511.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 22.79
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.234
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
  DEVELOPMENT TYPE/
                                    Fρ
                                            Αp
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                           19.46 0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           0.50
                                  0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.113
 SUBAREA AREA(ACRES) = 19.96
                            SUBAREA RUNOFF (CFS) = 38.62
 EFFECTIVE AREA(ACRES) = 31.69 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 31.7
                            PEAK FLOW RATE(CFS) =
                                                   61.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
******************
 FLOW PROCESS FROM NODE 11511.00 TO NODE 11512.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1135.00 DOWNSTREAM(FEET) = 1123.00
 FLOW LENGTH (FEET) = 1059.92 MANNING'S N = 0.013
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 27.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.52
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 61.22
 PIPE TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 24.47
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11512.00 = 2716.54 FEET.
******************
 FLOW PROCESS FROM NODE 11512.00 TO NODE 11512.00 IS CODE = 81
```

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 24.47
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.141
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fρ
                                                   SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     B
                             62.69
                                     0.75
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.11 0.75 0.600
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.109
 SUBAREA AREA(ACRES) = 63.80
                             SUBAREA RUNOFF(CFS) = 118.26
 EFFECTIVE AREA(ACRES) = 95.49 AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.11
 TOTAL AREA(ACRES) = 95.5
                              PEAK FLOW RATE(CFS) =
                                                   176.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
******************
 FLOW PROCESS FROM NODE 11512.00 TO NODE 11513.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1123.00 DOWNSTREAM(FEET) = 1106.00
 FLOW LENGTH (FEET) = 1613.25 MANNING'S N = 0.013
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 42.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.32
 ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 176.82
 PIPE TRAVEL TIME (MIN.) = 2.02 Tc (MIN.) = 26.49
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11513.00 = 4329.79 FEET.
*********************
 FLOW PROCESS FROM NODE 11513.00 TO NODE 11513.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 26.49
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.041
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fр
                                            Aр
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                            92.51
                                     0.75
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           5.00
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.126
 SUBAREA AREA(ACRES) = 97.51
                            SUBAREA RUNOFF (CFS) = 170.91
 EFFECTIVE AREA(ACRES) = 193.00 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 193.0 PEAK FLOW RATE (CFS) =
                                                 339.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
```

File name: LR011577.RFS

Page 12

Date: 04/21/2014

Date: 04/21/2014 File name: LR0115ZZ.RES Page 11

```
******************
 FLOW PROCESS FROM NODE 11513.00 TO NODE 11514.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1106.00 DOWNSTREAM(FEET) = 1096.00
 FLOW LENGTH (FEET) = 1097.91 MANNING'S N = 0.013
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 53.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.93
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 339.18
 PIPE TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 27.72
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11514.00 = 5427.70 FEET.
******************
 FLOW PROCESS FROM NODE 11514.00 TO NODE 11514.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 27.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.987
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    B 60.02 0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           3.42 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.127
 SUBAREA AREA(ACRES) = 63.44
                             SUBAREA RUNOFF (CFS) = 108.02
 EFFECTIVE AREA(ACRES) = 256.44 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 256.4 PEAK FLOW RATE (CFS) =
                                                 437.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.01; 30M = 0.02; 1HR = 0.03; 3HR = 0.04; 6HR = 0.05; 24HR = 0.07
********************
 FLOW PROCESS FROM NODE 11514.00 TO NODE 11515.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1096.00 DOWNSTREAM(FEET) = 1085.00
 FLOW LENGTH (FEET) = 1031.14 MANNING'S N = 0.013
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 59.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.70
 ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 437.71
 PIPE TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 28.74
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11515.00 = 6458.84 FEET.
FLOW PROCESS FROM NODE 11515.00 TO NODE 11515.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

```
MAINLINE Tc(MIN.) = 28.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.944
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                           Αp
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                   B 35.05 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.97 0.75 0.600
                                               56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.127
                          SUBAREA RUNOFF(CFS) = 61.61
 SUBAREA AREA(ACRES) = 37.02
 EFFECTIVE AREA(ACRES) = 293.46 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 293.5 PEAK FLOW RATE (CFS) =
                                                489.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
******************
 FLOW PROCESS FROM NODE 11515.00 TO NODE 11516.00 IS CODE = 31
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1085.00 DOWNSTREAM(FEET) = 1075.00
 FLOW LENGTH (FEET) = 1032.32 MANNING'S N = 0.013
 DEPTH OF FLOW IN 81.0 INCH PIPE IS 61.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 16.70
 ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 489.40
 PIPE TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 29.77
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11516.00 = 7491.16 FEET.
************************
 FLOW PROCESS FROM NODE 11516.00 TO NODE 11516.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
MAINLINE Tc(MIN.) = 29.77
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.903
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   B 24.85 0.75 0.100
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.36 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.126
 SUBAREA AREA(ACRES) = 26.21 SUBAREA RUNOFF(CFS) = 42.67
 EFFECTIVE AREA(ACRES) = 319.67 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA(ACRES) = 319.7 PEAK FLOW RATE(CFS) =
                                                521.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.31
```

Date: 04/21/2014 File name: LR0115ZZ.RES Page 13 Date: 04/21/2014 File name: LR0115ZZ.RES Page 14

```
FLOW PROCESS FROM NODE 11516.00 TO NODE 11517.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 ELEVATION DATA: UPSTREAM(FEET) = 1075.00 DOWNSTREAM(FEET) = 1062.00
 FLOW LENGTH (FEET) = 1261.29 MANNING'S N = 0.013
 DEPTH OF FLOW IN 81.0 INCH PIPE IS 63.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.27
 ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 521.34
 PIPE TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 30.99
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11517.00 =
********************
 FLOW PROCESS FROM NODE 11517.00 TO NODE 11517.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 30.99
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.858
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                           Ap SCS
                                  Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                            59.13
                                     0.75
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                            1.40
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.112
 SUBAREA AREA(ACRES) = 60.53
                            SUBAREA RUNOFF (CFS) = 96.67
 EFFECTIVE AREA(ACRES) = 380.20 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) =
                  380.2
                              PEAK FLOW RATE(CFS) =
                                                  605.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.61
FLOW PROCESS FROM NODE 11517.00 TO NODE 11518.00 IS CODE = 31
-----
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1062.00 DOWNSTREAM(FEET) = 1055.00
 FLOW LENGTH (FEET) = 697.90 MANNING'S N = 0.013
 DEPTH OF FLOW IN 87.0 INCH PIPE IS 66.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.83
 ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) =
                605.01
 PIPE TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 31.64
 LONGEST FLOWPATH FROM NODE 11508.00 TO NODE 11518.00 = 9450.35 FEET.
*******************
 FLOW PROCESS FROM NODE 11518.00 TO NODE 11518.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 31.64
```

File name: LR0115ZZ.RES

Page 15

Date: 04/21/2014

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.835 SUBAREA LOSS RATE DATA(AMC II):									
DEVELOPMENT TYPE/	,	AREA	Fp	Аp	SCS				
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN				
COMMERCIAL	В	26.47	0.75	0.100	56				
RESIDENTIAL									
"3-4 DWELLINGS/ACRE"	В	3.90	0.75	0.600	56				
NATURAL FAIR COVER									
			0.61		66				
SUBAREA AVERAGE PERVIOU				.64					
SUBAREA AVERAGE PERVIOU			-						
SUBAREA AREA (ACRES) =									
EFFECTIVE AREA (ACRES) =					= 0.11				
AREA-AVERAGED Fp(INCH/H TOTAL AREA(ACRES) =			-		662 24				
IOIAL AREA (ACRES) -	427.3	PLAN	FLOW RAIL(	CFS) -	002.34				
SUBAREA AREA-AVERAGED R	ATNEALL DE	грти (тмен	١.						
5M = 0.31; 30M = 0.64;				1.65: 24HI	R = 3.61				
=======================================		•	*	========	========				
END OF STUDY SUMMARY:									
TOTAL AREA (ACRES) =	427.	.3 TC (MI	N.) = 3	1.64					
EFFECTIVE AREA(ACRES) =	427.34	AREA-A	VERAGED Fm(	INCH/HR)=	0.11				
AREA-AVERAGED Fp(INCH/H	R) = 0.71	AREA-A	VERAGED Ap	= 0.158					
PEAK FLOW RATE(CFS) =	662.3	34							
	=======		=======	=======	=======				

\_\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0115ZZ.RES Page 16

Date: 04/21/2014 File name: LR0115ZZ.RES Page 17 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 20151

\* 100-YR HC ULTIMATE CONDITION SEPTEMBER 2013 TMULI

FILE NAME: LR0201ZZ.DAT

Date: 04/21/2014

TIME/DATE OF STUDY: 08:59 10/03/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

MITDELL							
WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
=====	=======	=======================================	=====	=====	=====	=====	======
18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
	15.0 18.0 15.0 16.0 17.0 30.0 24.0 24.0 32.0 39.0 36.0	15.0 10.0 18.0 10.0 15.0 10.0 16.0 10.0 17.0 10.0 30.0 15.0 24.0 15.0 24.0 15.0 32.0 20.0 39.0 20.0 36.0 20.0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	15.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.125           18.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.125           15.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           16.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.125           16.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           17.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           30.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           24.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           32.0         20.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           39.0         20.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           36.0         20.0         0.020/0.020/0.020         0.67         2.00         0.0312

File name: LR020177.RFS

Page 1

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc S-GRAPH TYPE PERCENTAGE (DECIMAL) 1.000 VALLEY (DEVELOPED) 0.000 FOOTHILL MOUNTAIN 0.000 VALLEY (UNDEVELOPED) / DESERT 0.000 DESERT (UNDEVELOPED) 0.000 PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20100.00 TO NODE 20101.00 IS CODE = 21 \_\_\_\_\_\_ >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 219.52 ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2385.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.474 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.755 SUBAREA To AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS Tc αA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) NATURAL FAIR COVER B 1.33 0.61 1.000 "OPEN BRUSH" 66 10.43 NATURAL FAIR COVER "OPEN BRUSH" A 0.04 0.86 1.000 46 10.43 RESIDENTIAL B 2.55 0.75 0.700 "2 DWELLINGS/ACRE" 56 6.47 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.805 SUBAREA RUNOFF(CFS) = 14.81 TOTAL AREA(ACRES) = 3.92 PEAK FLOW RATE(CFS) = 14.81 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 9.00

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA

Date: 04/21/2014 File name: LR0201ZZ.RES Page 2

FLOW PROCESS FROM NODE 20101.00 TO NODE 20102.00 IS CODE = 63

```
>>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 2385.00 DOWNSTREAM ELEVATION(FEET) = 2340.00
 STREET LENGTH (FEET) = 138.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.45
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.32
   HALFSTREET FLOOD WIDTH (FEET) = 9.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.39
 STREET FLOW TRAVEL TIME (MIN.) = 0.22 Tc (MIN.) = 6.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.660
 SUBAREA LOSS RATE DATA (AMC II):
                                      Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  Aр
                                                        SCS
      LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
  "OPEN BRUSH"
                      A 0.45 0.86
                                                1.000
                                                       46
 NATURAL FAIR COVER
                        B 0.90
 "OPEN BRUSH"
                                         0.61
                                               1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.01
                                         0.75
                                               0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.793
 SUBAREA AREA (ACRES) = 4.36 SUBAREA RUNOFF (CFS) = 16.02
 EFFECTIVE AREA(ACRES) = 8.28 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 8.3
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 8.79
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.35 HALFSTREET FLOOD WIDTH(FEET) = 11.09
 FLOW VELOCITY (FEET/SEC.) = 11.32 DEPTH*VELOCITY (FT*FT/SEC.) = 3.94
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20102.00 = 358.25 FEET.
FLOW PROCESS FROM NODE 20102.00 TO NODE 20103.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2340.00 DOWNSTREAM ELEVATION(FEET) = 2320.00
 STREET LENGTH (FEET) = 287.27 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    42.06
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.79
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.20
 STREET FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 7.40
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.389
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                      Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                      A 1.17 0.86
 "OPEN BRUSH"
                                                 1.000
                                                          46
 NATURAL FAIR COVER
                      В 2.63
 "OPEN BRUSH"
                                         0.61 1.000
                                                          66
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.01
                                         0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
 SUBAREA AREA(ACRES) = 6.81 SUBAREA RUNOFF(CFS) = 23.12
 EFFECTIVE AREA(ACRES) = 15.09 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.83
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                          51.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 8.63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 7.23 DEPTH*VELOCITY (FT*FT/SEC.) = 3.60
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20103.00 = 645.52 FEET.
*******************
 FLOW PROCESS FROM NODE 20103.00 TO NODE 20104.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2320.00 DOWNSTREAM ELEVATION(FEET) = 2310.00
 STREET LENGTH (FEET) = 249.70 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
       Date: 04/21/2014 File name: LR0201ZZ.RES
                                                        Page 4
```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

Date: 04/21/2014 File name: LR0201ZZ.RES Page 3 Date

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.69 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\* \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.64STREET FLOW DEPTH (FEET) = 0.78HALFSTREET FLOOD WIDTH (FEET) = 24.79 HALFSTREET FLOOD WIDTH (FEET) = 32.17 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.45 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.74 STREET FLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 7.96 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.201 SUBAREA LOSS RATE DATA (AMC II): SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE LAND USE NATURAL FAIR COVER NATURAL FAIR COVER A 1.82 A 5.68 "OPEN BRUSH" 0.86 1.000 46 "OPEN BRUSH" NATURAL FAIR COVER RESIDENTIAL В 19.46 "OPEN BRUSH" 0.61 1.000 66 "2 DWELLINGS/ACRE" A 3.92 RESIDENTIAL RESIDENTIAL "2 DWELLINGS/ACRE" B 6.79 B 6.10 0.75 0.700 56 "2 DWELLINGS/ACRE" RESIDENTIAL NATURAL FAIR COVER A 0.01 0.98 0.700 39.60 "2 DWELLINGS/ACRE" "OPEN BRUSH" В SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927 SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 90.80 EFFECTIVE AREA(ACRES) = 43.17 AREA-AVERAGED Fm(INCH/HR) = 0.60 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89 TOTAL AREA (ACRES) = 43.2 PEAK FLOW RATE (CFS) = 139.84 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.80 END OF SUBAREA STREET FLOW HYDRAULICS: END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.51 FLOW VELOCITY (FEET/SEC.) = 8.23 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.85 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 249.7 FT WITH ELEVATION-DROP = 10.0 FT, IS 93.9 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20104.00 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20104.00 = 895.22 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20104.00 TO NODE 20105.00 IS CODE = 63 PIPE-FLOW VELOCITY (FEET/SEC.) = 48.16 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< PIPE-FLOW(CFS) = 139.84>>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2310.00 DOWNSTREAM ELEVATION(FEET) = 2270.00 STREET LENGTH (FEET) = 747.57 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 \*NOTE: STREET-CAPACITY MAY BE EXCEEDED\* OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 STREETFLOW HYDRAULICS BASED ON MAINLINE To : SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 \*\*\*STREET FLOWING FULL\*\*\* STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.27 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 8.05 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 9.17 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.858 Fρ SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN 0.86 1.000 46 0.98 0.700 32 0.75 0.700 56 0.61 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946 SUBAREA AREA (ACRES) = 55.30 SUBAREA RUNOFF (CFS) = 160.46 EFFECTIVE AREA(ACRES) = 98.47 AREA-AVERAGED Fm(INCH/HR) = 0.62 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.92 TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) = 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.72 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.77 FLOW VELOCITY (FEET/SEC.) = 10.90 DEPTH\*VELOCITY (FT\*FT/SEC.) = 9.32 \*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE \*\* ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.5 INCHES PIPEFLOW TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 8.22\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.121 SUBAREA AREA (ACRES) = 55.30 SUBAREA RUNOFF (CFS) = 173.55 TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) = 310.29 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.72 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 170.44 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

File name: LR0201ZZ.RES

Page 6

Date: 04/21/2014

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

Date: 04/21/2014 File name: LR0201ZZ.RES Page 5

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

```
STREET FLOW DEPTH (FEET) = 0.72
  HALFSTREET FLOOD WIDTH (FEET) = 29.12
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.63
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.96
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20105.00 = 1642.79 FEET.
*******************
 FLOW PROCESS FROM NODE 20105.00 TO NODE 20106.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2270.00 DOWNSTREAM(FEET) = 2230.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1238.14 CHANNEL SLOPE = 0.0323
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.30
 CHANNEL FLOW THRU SUBAREA(CFS) = 310.29
 FLOW VELOCITY (FEET/SEC.) = 10.74 FLOW DEPTH (FEET) = 2.75
 TRAVEL TIME (MIN.) = 1.92 Tc (MIN.) = 10.14
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20106.00 = 2880.93 FEET.
********************
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20106.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 10.14
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.633
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Aр
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            2.42
                                    0.86
                                           1.000
                    A
                                                  46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                           7.44
                                    0.98
                                           0.700
                                                  32
                    A
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            21.25
                                    0.75
                                           0.700
                     В
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                           127.72
                                    0.61
                                         1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946
 SUBAREA AREA(ACRES) = 158.83
                           SUBAREA RUNOFF (CFS) = 432.26
 EFFECTIVE AREA(ACRES) = 257.30 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.94
 TOTAL AREA (ACRES) = 257.3
                           PEAK FLOW RATE(CFS) =
                                                 699.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.52
******************
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20107.00 IS CODE = 54
._____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2230.00 DOWNSTREAM(FEET) = 2170.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1330.76 CHANNEL SLOPE = 0.0451
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
```

```
MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 12.03 FLOW DEPTH (FEET) = 1.74
 TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 11.98
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20107.00 = 4211.69 FEET.
***********************
 FLOW PROCESS FROM NODE 20107.00 TO NODE 20107.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 11.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.286
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fρ
                                                   SCS
                                             Αр
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                           2.55
                                     0.86
                                            1.000
                                                   46
 "OPEN BRUSH"
                      Α
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      A 12.67
                                     0.98
                                            0.700
                                                   32
 RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                      B 10.30
                                     0.75
                                            0.700
                                                   56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                            66.90
                                     0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.925
 SUBAREA AREA (ACRES) = 92.42
                            SUBAREA RUNOFF (CFS) = 221.76
 EFFECTIVE AREA(ACRES) = 349.72 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.93
 TOTAL AREA (ACRES) = 349.7
                              PEAK FLOW RATE(CFS) =
                                                   840.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20107.00 TO NODE 20108.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2095.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1995.70 CHANNEL SLOPE = 0.0376
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              840.78
 FLOW VELOCITY (FEET/SEC.) = 12.08 FLOW DEPTH (FEET) = 2.04
 TRAVEL TIME (MIN.) = 2.75 Tc (MIN.) = 14.73
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20108.00 = 6207.39 FEET.
******************
 FLOW PROCESS FROM NODE 20108.00 TO NODE 20108.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.73
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.903
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                   SCS
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 8

LAND USE NATURAL FAIR COVER	GROUP (ACR	ES) (INCH/HR)	(DECIMAL)	CN	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.834 SUBAREA AREA(ACRES) = 194.98 SUBAREA RUNOFF(CFS) = 357.76
"OPEN BRUSH"	A 3	.92 0.86	1.000	46	EFFECTIVE AREA (ACRES) = 690.11 AREA-AVERAGED Fm(INCH/HR) = 0.59
RESIDENTIAL	n J	. 52 0.00	1.000	10	AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.88
"2 DWELLINGS/ACRE"	A 0	.86 0.98	0.700	32	
	Α 0	.00 0.90	0.700	32	TOTAL AREA(ACRES) = 690.1 PEAK FLOW RATE(CFS) = 1259.07
RESIDENTIAL	. 10	0.5	0 600	2.0	CURRENT AREA AVERAGE STATES A PROPERTY (TAGET)
"3-4 DWELLINGS/ACRE"		.85 0.98	0.600	32	SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
MOBILE HOME PARK	В 25	.39 0.75	0.250	56	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
RESIDENTIAL					*****************
"3-4 DWELLINGS/ACRE"	В 10	.75 0.75	0.600	56	
NATURAL FAIR COVER					FLOW PROCESS FROM NODE 20109.00 TO NODE 20109.00 IS CODE = 71
"OPEN BRUSH"		.64 0.61	1.000	66	
SUBAREA AVERAGE PERVIO	'		0.67		>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
SUBAREA AVERAGE PERVIO					>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
SUBAREA AREA(ACRES) =	145.41 SU	BAREA RUNOFF(CE	rs) = 310.3	39	
EFFECTIVE AREA(ACRES)	= 495.13 A	REA-AVERAGED Fm	n(INCH/HR) :	= 0.59	UNIT-HYDROGRAPH DATA:
AREA-AVERAGED Fp(INCH/	/HR) = 0.66 AR	EA-AVERAGED Ap	= 0.89		RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.25;6H= 3.25;24H= 7.56
TOTAL AREA (ACRES) =	495.1	PEAK FLOW RATE (	(CFS) =	1030.46	S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
					MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
SUBAREA AREA-AVERAGED	RAINFALL DEPTH (	INCH):			Tc(HR) = 0.29; LAG(HR) = 0.23; Fm(INCH/HR) = 0.59; Ybar = 0.51
5M = 0.46; 30M = 0.95;	; 1HR = 1.25; 3H	R = 2.25; 6HR =	3.25; 24H	R = 7.50	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
	,,,,				DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
*******	******	******	*****	*****	3HR = 1.00; 6HR = 1.00; 24HR= 1.00
FLOW PROCESS FROM NODE	E 20108 00 TO N	ODE 20109 00 T	S CODE =	5.4	UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 690.1
					LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20109.00 = 8231.30 FEET.
					EOUIVALENT BASIN FACTOR APPROXIMATIONS:
>>>>COMPUTE TRAPEZOID			,		~
>>>>TRAVELTIME THRU S		- ,			Lca/L=0.3, n=.0313; Lca/L=0.4, n=.0280; Lca/L=0.5, n=.0257; Lca/L=0.6, n=.0240
=======================================					TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 224.38
ELEVATION DATA: UPSTRE	, ,		, ,		UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) = 1254.71
CHANNEL LENGTH THRU SU	JBAREA (FEET) =	2023.91 CHANN	IEL SLOPE =	0.0371	TOTAL PEAK FLOW RATE(CFS) = 1254.71 (SOURCE FLOW INCLUDED)
CHANNEL BASE (FEET) =	40.00 "Z" FA	CTOR = 2.000			RATIONAL METHOD PEAK FLOW RATE(CFS) = 1259.07
MANNING'S FACTOR = $0.0$	035 MAXIMUM DE	PTH(FEET) = 10	0.00		(UPSTREAM NODE PEAK FLOW RATE(CFS) = 1259.07)
CHANNEL FLOW THRU SUBA	AREA(CFS) = 1	030.46			PEAK FLOW RATE(CFS) USED = 1259.07
FLOW VELOCITY (FEET/SEC	C.) = 11.95 F	LOW DEPTH (FEET)	= 1.96		
TRAVEL TIME (MIN.) =					*******************
LONGEST FLOWPATH FROM			00 = 82	31.30 FEET.	FLOW PROCESS FROM NODE 20109.00 TO NODE 20110.00 IS CODE = 54
*******	******	******	*****	*****	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
FLOW PROCESS FROM NODE	E 20109.00 TO N	ODE 20109.00 I	S CODE =	81	>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
>>>>ADDITION OF SUBAR	REA TO MAINLINE	PEAK FLOW<			ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 1960.00
=======================================					CHANNEL LENGTH THRU SUBAREA (FEET) = 1927.24 CHANNEL SLOPE = 0.0311
MAINLINE Tc(MIN.) =					CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
		٠			
* 100 YEAR RAINFALL IN		) = 2.613			MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 5.00
SUBAREA LOSS RATE DATA					CHANNEL FLOW THRU SUBAREA(CFS) = 1259.07
	SCS SOIL AR	-	_	SCS	FLOW VELOCITY(FEET/SEC.) = 27.63 FLOW DEPTH(FEET) = 2.89
LAND USE	GROUP (ACR	ES) (INCH/HR)	(DECIMAL)	CN	TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 18.72
NATURAL FAIR COVER					LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20110.00 = 10158.54 FEET.
"OPEN BRUSH"	A 2	.81 0.86	1.000	46	
RESIDENTIAL					*****************
"3-4 DWELLINGS/ACRE"	A 27	.06 0.98	0.600	32	FLOW PROCESS FROM NODE 20110.00 TO NODE 20110.00 IS CODE = 81
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В 26	.94 0.75	0.600	56	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
	2 20		0.000	5.0	
RESIDENTIAL	D 25	77 ^ 75	0 700	E.C.	
"2 DWELLINGS/ACRE"	В 35	.77 0.75	0.700	56	MAINLINE TC(MIN.) = 18.72
NATURAL FAIR COVER	_ 200	40 00:	4 000		* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.514
"OPEN BRUSH"	В 102		1.000	66	SUBAREA LOSS RATE DATA (AMC II):
SUBAREA AVERAGE PERVIO	OUS LOSS RATE, F	p(INCH/HR) = 0	0.69		DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
Date: 04/21/2014	File name: LR0	0201ZZ.RES		Page 9	Date: 04/21/2014 File name: LR0201ZZ.RES Page 10
				-	

	GROUP	(ACDES)	(INCH/HR)	(DECIMAL)	CN		NATURAL FAIR COVER						
LAND USE NATURAL FAIR COVER	GIVOUI	(ACNES)	(INCII/IIII)	(DECIMAL)	CIV		"OPEN BRUSH"	A	28.59	0.86	1.000	46	
"OPEN BRUSH"	А	5.83	0.86	1.000	46		RESIDENTIAL		20.03	0.00	2.000	10	
RESIDENTIAL							"3-4 DWELLINGS/ACRE"	A	31.08	0.98	0.600	32	
"3-4 DWELLINGS/ACRE"	A	33.80	0.98	0.600	32		RESIDENTIAL						
RESIDENTIAL							"3-4 DWELLINGS/ACRE"	В	31.56	0.75	0.600	56	
"3-4 DWELLINGS/ACRE"	В	25.19	0.75	0.600	56		NATURAL FAIR COVER						
RESIDENTIAL							"OPEN BRUSH"	В	41.72	0.61	1.000	66	
"2 DWELLINGS/ACRE"	В	9.84	0.75	0.700	56		RESIDENTIAL						
NATURAL FAIR COVER							".4 DWELLING/ACRE"	В	5.26	0.75	0.900	56	
"OPEN BRUSH"	В	45.99	0.61	1.000	66		SUBAREA AVERAGE PERVIOU	S LOSS RAT	E, Fp(INCH	/HR) = 0	.76		
SUBAREA AVERAGE PERVIO	US LOSS RA	TE, Fp(IN	CH/HR) = 0	.74			SUBAREA AVERAGE PERVIOU	S AREA FRA	CTION, Ap	= 0.815			
SUBAREA AVERAGE PERVIO	US AREA FR	RACTION, A	p = 0.780				SUBAREA AREA(ACRES) =	138.21					
SUBAREA AREA(ACRES) =	120.65						UNIT-HYDROGRAPH DATA:						
UNIT-HYDROGRAPH DATA:							RAINFALL(INCH): 5M= 0.4	6;30M= 0.9	5;1H= 1.25	;3H= 2.24;	;6H= 3.22;	24H= 7.55	
RAINFALL(INCH): 5M= 0.4	46;30M= 0.	95;1H= 1.	25;3H= 2.25	;6H= 3.25;2	24H= 7.55		S-GRAPH: VALLEY (DEV.)=1	00.0%; VALL	EY (UNDEV.)	/DESERT=	0.0%		
S-GRAPH: VALLEY (DEV.) =	100.0%;VAI	LEY (UNDEV	.)/DESERT=	0.0%			MOUNTAIN= 0.0	%;FOOTHILL:	= 0.0%;DE	SERT (UNDEV	V.)= 0.0%		
MOUNTAIN= 0.0	0%;FOOTHIL	L= 0.0%;	DESERT (UNDE	V.)= 0.0%			Tc(HR) = 0.32; LAG(HR)	= 0.26; Fm	(INCH/HR)	= 0.59; Yh	par = 0.52		
Tc(HR) = 0.31; LAG(HR)	= 0.25; F	m(INCH/HR	) = 0.58; Y	bar = 0.51			USED SIERRA MADRE DEPTH	-AREA CURV	ES WITH AM	C II CONI	DITION.		
USED SIERRA MADRE DEPTH	H-AREA CUR	EVES WITH	AMC II CON	DITION.			DEPTH-AREA FACTORS: 5M	= 0.96; 301	M = 0.96;	1HR = 0.96	6 <b>;</b>		
DEPTH-AREA FACTORS: 5M	= 0.96; 3	80M = 0.96	; $1HR = 0.9$	6;			3HR = 0.99; 6HR = 1.00;	24HR= 1.0	0				
3HR = 0.99; 6HR = 1.00;							UNIT-INTERVAL (MIN) = 5						
UNIT-INTERVAL (MIN) = 5	5.00 TOT	'AL AREA(A	CRES) =	810.8			LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20111.00 = 11086.87 FEET.						
LONGEST FLOWPATH FROM 1			ODE 20110.	00 = 1015	58.54 FEET.		EQUIVALENT BASIN FACTOR APPROXIMATIONS:						
EQUIVALENT BASIN FACTO							Lca/L=0.3,n=.0269; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0207						
Lca/L=0.3,n=.0281; Lca				0231;Lca/L=	=0.6,n=.0216		TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 301.99						
TIME OF PEAK FLOW(HR) =				262.28			UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1653.30						
UNIT-HYDROGRAPH PEAK FI		,					TOTAL AREA (ACRES) =	949.0	PEAK F	LOW RATE (	CFS) =	1653.30	
TOTAL AREA(ACRES) =	810.8	PEAK	FLOW RATE (	CFS) = 1	1443.23								
							SUBAREA AREA-AVERAGED R		, ,				
SUBAREA AREA-AVERAGED I		•	,	0.05.04***			5M = 0.46; 30M = 0.95;	1HR = 1.25	; $3HR = 2$ .	16; 6HR =	3.06; 24H	R = 7.50	
5M = 0.46; 30M = 0.95;	IHK = I.2	:5: 3HK =	/./h: hHR =	3./5: /4HF									
			2.20, 01110	0.20, 2									
	++++++++	•	•	•		*	**************************************						
		*****	*****	******	*****		FLOW PROCESS FROM NODE	20111.00	TO NODE 2	0112.00 IS	S CODE =	54	
FLOW PROCESS FROM NODE	20110.00	**************  TO NODE	**************************************	************ S CODE = 5	******* 54		FLOW PROCESS FROM NODE	20111.00	TO NODE 2	0112.00 IS	S CODE =	54	
FLOW PROCESS FROM NODE	20110.00	**************************************	********* 20111.00 I	************ S CODE = 5	******* 54		FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA	20111.00 '	TO NODE 2	0112.00 IS	S CODE =	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID	20110.00 AL CHANNEL	*********  TO NODE  FLOW<<<<	********* 20111.00 I 	********** S CODE = 5	******* 54	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA  >>>>TRAVELTIME THRU SU	20111.00 CHANNEL CHANNEL CHANNEL	TO NODE 2  FLOW<<<< STING ELEM	0112.00 IS	S CODE =	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA  >>>>TRAVELTIME THRU SU	20110.00 AL CHANNEL UBAREA (EX	******** TO NODE FLOW<<<<	********** 20111.00 I < EMENT) <<<<	*********** S CODE = 5	******** 54 	-	FLOW PROCESS FROM NODE  >>>>>COMPUTE TRAPEZOIDA  >>>>>TRAVELTIME THRU SU	20111.00 L CHANNEL BAREA (EXI	TO NODE 2 FLOW<<<< STING ELEM	0112.00 IS 	S CODE =	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA  >>>>TRAVELTIME THRU SU	20110.00 AL CHANNEL UBAREA (EX	TO NODE FLOW<<<	*********** 20111.00 I < EMENT) <<<<<	********** S CODE = 5	*********	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA  >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA	20111.00 L CHANNEL BAREA (EXIMINATE EXIMINATE	TO NODE 2FLOW<>>> STING ELEM	0112.00 IS ENT) <<<< 	S CODE =  ============================	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA	20110.00AL CHANNEL UBAREA (EX AM(FEET) =	********* TO NODE  FLOW<<<< ISTING EL  1960.0	********** 20111.00 I < EMENT) <<<<> 0 DOWNSTRE	*********** S CODE = 5	******** 54  1920.00	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB	20111.00 ' L CHANNEL : BAREA (EXI: """ M (FEET) = AREA (FEET)	TO NODE 2 FLOW<>> STING ELEM 1920.00 = 1664.9	0112.00 IS  ENT) <<<< 	S CODE =  ============================	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SU	20110.00  AL CHANNEL UBAREA (EX  AM(FEET) = BAREA(FEET	********** TO NODE FLOW<<<< CISTING EL 1960.0 1) = 928	********* 20111.00 I < EMENT) <<<<=======0 0 DOWNSTRE .33 CHANN	*********** S CODE = 5	******** 54  1920.00	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) =	20111.00 ' L CHANNEL : BAREA (EXI: """ M(FEET) = 'AREA (FEET) 10.00 "Z	TO NODE 2 FLOW<>> STING ELEM 1920.00 = 1664.9 " FACTOR =	0112.00 IS 	S CODE = 	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =	20110.00 AL CHANNEL UBAREA (EX AM (FEET) = BAREA (FEET 10.00 "	******** TO NODE	********* 20111.00 I < EMENT) <<<<=======0 0 DOWNSTRE .33 CHANN = 2.000	*********  S CODE = 5  AM(FEET) = EL SLOPE =	******** 54  1920.00	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01	20111.00  L CHANNEL  BAREA (EXI  M(FEET) =  AREA (FEET)  10.00 "Z  5 MAXIMUI	FLOW<<<< STING ELEM 1920.00 = 1664.9 " FACTOR =	0112.00 IS ENT) <<<< ========= DOWNSTREA 7 CHANNI 2.000 ET) = 5	S CODE = 	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.00	20110.00  AL CHANNEI UBAREA (EX  =======  AM(FEET) = BAREA(FEET  10.00 " 15 MAXIM	******** TO NODE	********* 20111.00 I < EMENT) <<<<======== 0 DOWNSTRE .33 CHANN = 2.000 FEET) = 5	*********  S CODE = 5  AM(FEET) = EL SLOPE =	******** 54  1920.00	-	>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SU ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUE CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR	20111.00  L CHANNEL  BAREA (EXI  M(FEET) =  AREA (FEET)  10.00 "Z  5 MAXIMUI  EA (CFS) =	FLOW<<<< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH (FE 1653.30	0112.00 IS 	S CODE = AM(FEET) = EL SLOPE =	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID; >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE; CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI	20110.00	******** TO NODE	*********  20111.00 I  < EMENT) <<<<=======  0 DOWNSTRE .33 CHANN = 2.000  FEET) = 5  23	*********  S CODE = 5	******** 54  1920.00	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC.	20111.00 "L CHANNEL "BAREA (EXI "M(FEET) = "AREA (FEET) 10.00 "Z 5 MAXIMUI EA (CFS) = ) = 29.43	FLOW<<<< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE	0112.00 IS ENT) <<<<< DOWNSTREA 7 CHANNI 2.000 ET) = 5	S CODE = AM(FEET) = EL SLOPE =	54	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID; >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE; CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC	20110.00	******** TO NODE FLOW<<<< ISTING EL FLOW ISTING EL FLOW FLOW FLOW FLOW FLOW FLOW FLOW FLO	*********  20111.00 I  < EMENT) <<<<======0  0 DOWNSTRE .33 CHANN = 2.000  FEET) = 5  23  DEPTH (FEET)	*********  S CODE = 5	******** 54  1920.00	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0	20111.00 "L CHANNEL EBAREA (EXILIENTE EXILIENTE EX	FLOW<<<< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2	0112.00 IS 	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBAL FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = 0	20110.00	******** TO NODE	*********  20111.00 I  EMENT) <<<<< =======  0 DOWNSTRE  .33 CHANN = 2.000 FEET) = 5 23 DEPTH (FEET) 19.20	*********  S CODE = 5	**********  1920.00 0.0431	-	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC.	20111.00 "L CHANNEL EBAREA (EXILIENTE EXILIENTE EX	FLOW<<<< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2	0112.00 IS 	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID; >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE; CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC	20110.00	******** TO NODE	*********  20111.00 I  EMENT) <<<<< =======  0 DOWNSTRE  .33 CHANN = 2.000 FEET) = 5 23 DEPTH (FEET) 19.20	*********  S CODE = 5	**********  1920.00 0.0431	=	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0	20111.00  L CHANNEL  BAREA (EXI   M(FEET) =  AREA(FEET)  10.00 "Z  5 MAXIMUL  EA(CFS) =  ) = 29.43  .94 Tc(M  ODE 20100	FLOW<<<<< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD	0112.00 IS ENT) <<<< DOWNSTRE,7 7 CHANNI 2.000 ET) = 5. PTH (FEET) 0.14 E 20112.0	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1	20110.00	******** TO NODE	********** 20111.00 I	**********  S CODE = 5	**************************************	=	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N	20111.00 "	FLOW<>>< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1	20110.00	******** TO NODE	**********  20111.00 I	**********  S CODE = 5  AM (FEET) = EL SLOPE = .00  = 2.85  00 = 1108  **********************************	**************************************	=	>>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUE CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N	20111.00 "	FLOW<>>< STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU  CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.0  CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC  TRAVEL TIME (MIN.) = (  LONGEST FLOWPATH FROM 1	20110.00	******** TO NODE  FLOW<<<< ISTING EL  1960.0  19 = 928  12" FACTOR  MIN.) = 1443.  8 FLOW  MIN.) = 0.00 TO N	*********  20111.00 I	**********  S CODE = 5	**************************************	=	>>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUE CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N	20111.00 '	FLOW<><<< STING ELEM 1920.00 = 1664.9 "FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAH FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM NODE	20110.00	******** TO NODE  FLOW<<<< ISTING EL  1960.0  19 = 928  12" FACTOR  MIN.) = 1443.  8 FLOW  MIN.) = 0.00 TO N  ********  TO NODE	*********  20111.00 I	**********  S CODE = 5	**************************************	*	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SUBLETATION DATA: UPSTREA CHANNEL LENGTH THRU SUBLETANNEL BASE (FEET) =  MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM NODE	20111.00 "	FLOW<><<< STING ELEM 1920.00 = 1664.9 "FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD ************************************	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0. CHANNEL FLOW THRU SUBAF FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	********  TO NODE  FLOW<<<< ISTING EL  1960.0  P) = 928  Z' FACTOR  MUM DEPTH(  1443.  8 FLOW  MIN.) =  0.00 TO N  ********  TO NODE  LILINE PEAK	*********  20111.00 I	**********  S CODE = 5	1920.00 0.0431	*	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SUBLETATION DATA: UPSTREA CHANNEL LENGTH THRU SUBLETANNEL BASE (FEET) =  MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM NODE  ***********************************	20111.00	FLOW<><<< STING ELEM 1920.00 = 1664.9 "FACTOR = M DEPTH(FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD ************************************	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0. CHANNEL FLOW THRU SUBAF FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	********  TO NODE  FLOW<<<< ISTING EL  1960.0  P) = 928  Z' FACTOR  MUM DEPTH(  1443.  8 FLOW  MIN.) =  0.00 TO N  ********  TO NODE  LILINE PEAK	*********  20111.00 I	**********  S CODE = 5	1920.00 0.0431	*	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SUBELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUBECHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM NODE  ***********************************	20111.00  L CHANNEL: BAREA (EXI:  """ M(FEET) = AREA (FEET) 10.00 "Z 5 MAXIMULEA (CFS) = ) = 29.43 .94 Tc (M ODE 20100  ********** 20112.00  A TO MAINL  "" 0.14	FLOW < STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD ************************************	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0. CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	******** TO NODE  FLOW<<<< ISTING EL  1960.0 P) = 928 PZ FACTOR MUM DEPTH( 1443. 8 FLOW MIN.) = 10.00 TO N  ******** TO NODE  LILINE PEAK	*********  20111.00 I	**********  S CODE = 5	1920.00 0.0431	*	FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SUBLEDATION DATA: UPSTREA CHANNEL LENGTH THRU SUBCHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM NODE  ***********************************	20111.00  L CHANNEL: BAREA (EXI:	FLOW < STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD ************************************	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	******** TO NODE	*********  20111.00 I	**********  S CODE = 5	1920.00 0.0431	*	FLOW PROCESS FROM NODE  >>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SUBELEVATION DATA: UPSTREACHANNEL LENGTH THRU SUBECHANNEL BASE (FEET) =  MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM NODE  ***********************************	20111.00  L CHANNEL: BAREA (EXI:	FLOW < STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD ************************************	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	******** TO NODE  FLOW<<<< ISTING EL ====================================	*********  20111.00 I	**********  S CODE = 5	1920.00 0.0431	*	>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SUB ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N  ***********************************	20111.00	FLOW < STING ELEM 1920.00 = 1664.9 " FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD *********** TO NODE 2 INE PEAK F	0112.00 IS	S CODE =	54 	
>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SU ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUI CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1) ************************************	20110.00	******** TO NODE  FLOW< CISTING EL  ========  1960.0  19 = 928 Z" FACTOR  MIM DEPTH(  1443.88 FLOW  MIN.) =  10.00 TO N  *******  TO NODE  LILINE PEAK  ELICH/HR) =  AREA	********* 20111.00 I	*********  S CODE = 5	**************************************	*	>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SUB ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N  ***********************************	20111.00	FLOW FLOW FLOW FLOW FLOW FLOW 1920.00  = 1664.9  FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD  ************ TO NODE 2 INE PEAK F H/HR) = 2 AREA	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>COMPUTE TRAPEZOID >>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTRE CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	******** TO NODE  FLOW< CISTING EL  ========  1960.0  19 = 928 Z" FACTOR  MIM DEPTH(  1443.88 FLOW  MIN.) =  10.00 TO N  *******  TO NODE  LILINE PEAK  ELICH/HR) =  AREA	********* 20111.00 I	*********  S CODE = 5	**************************************	*	>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SUB ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N  ******************** FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE MAINLINE TC (MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE	20111.00	FLOW FLOW FLOW FLOW FLOW FLOW 1920.00  = 1664.9  FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD  ************ TO NODE 2 INE PEAK F H/HR) = 2 AREA	0112.00 IS	S CODE =	54 	
FLOW PROCESS FROM NODE  >>>>>COMPUTE TRAPEZOID >>>>>TRAVELTIME THRU SU  ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SU CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.00 CHANNEL FLOW THRU SUBAI FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = ( LONGEST FLOWPATH FROM 1)  ***********************************	20110.00	******** TO NODE  FLOW< CISTING EL  ========  1960.0  19 = 928 Z" FACTOR  MIM DEPTH(  1443.88 FLOW  MIN.) =  10.00 TO N  *******  TO NODE  LILINE PEAK  ELICH/HR) =  AREA	********* 20111.00 I	*********  S CODE = 5	**************************************	*	>>>>COMPUTE TRAPEZOIDA >>>>>TRAVELTIME THRU SUB ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 0 LONGEST FLOWPATH FROM N  ******************** FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE MAINLINE TC (MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE	20111.00  L CHANNEL: BAREA (EXI: M(FEET) = AREA(FEET) 10.00 "Z 5 MAXIMUI EA(CFS) = ) = 29.43	FLOW FLOW FLOW FLOW FLOW FLOW 1920.00  = 1664.9  FACTOR = M DEPTH (FE 1653.30 FLOW DE IN.) = 2 .00 TO NOD  ************ TO NODE 2 INE PEAK F H/HR) = 2 AREA	0112.00 IS	S CODE =	54 	

"3-4 DWELLINGS/ACRE"	A	8.51	0.98	0.600	32	RESIDENTIAL						
RESIDENTIAL	<b>.</b>	0 54	0.75	0 600	F. C	".4 DWELLING/ACRE" B 3.83 0.75 0.900 56						
"3-4 DWELLINGS/ACRE"	В	0.54	0.75	0.600	56	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75						
RESIDENTIAL	7	3.29	0.98	0.900	32	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743						
".4 DWELLING/ACRE" RESIDENTIAL	A	3.29	0.90	0.900	32	SUBAREA AREA(ACRES) = 8.02 UNIT-HYDROGRAPH DATA:						
".4 DWELLING/ACRE"	В .	75.85	0.75	0.900	56	RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.22;6H= 3.18;24H= 7.54						
NATURAL FAIR COVER	D	13.03	0.75	0.900	30	S-GRAPH: VALLEY (DEV.) = 100.0%; VALLEY (UNDEV.) / DESERT = 0.0%						
"OPEN BRUSH"	В	7.12	0.61	1.000	66	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.)= 0.0%						
SUBAREA AVERAGE PERVIOU					00	Tc(HR) = 0.35; LAG(HR) = 0.28; Fm(INCH/HR) = 0.60; Ybar = 0.53						
SUBAREA AVERAGE PERVIOU		-		70		USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.						
SUBAREA AREA(ACRES) =		10N, Ap -	0.075			DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;						
UNIT-HYDROGRAPH DATA:	JJ.JI					3HR = 0.99; 6HR = 1.00; 24HR= 1.00						
RAINFALL(INCH): 5M= 0.4	16:30M= 0 95:	1H= 1 25:3	H= 2 22:	6H= 3 18:	24H= 7 54	UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1052.3						
S-GRAPH: VALLEY (DEV.)=1			-	-	2 111 7 • 0 1	LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.						
MOUNTAIN= 0.0						EQUIVALENT BASIN FACTOR APPROXIMATIONS:						
Tc(HR) = 0.34; LAG(HR)						Lca/L=0.3,n=.0244; Lca/L=0.4,n=.0219; Lca/L=0.5,n=.0201; Lca/L=0.6,n=.0188						
USED SIERRA MADRE DEPTH						TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 330.18						
DEPTH-AREA FACTORS: 5M						UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1726.90						
3HR = 0.99; 6HR = 1.00;	24HR= 1.00					TOTAL AREA (ACRES) = 1052.3 PEAK FLOW RATE (CFS) = 1750.60						
UNIT-INTERVAL(MIN) = 5	.00 TOTAL	AREA (ACRES	5) =	1044.3		NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE						
LONGEST FLOWPATH FROM N	NODE 20100.00	0 TO NODE	20112.0	0 = 127	51.84 FEET.							
EQUIVALENT BASIN FACTO						SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):						
Lca/L=0.3,n=.0252; Lca	a/L=0.4, n=.02	26; Lca/L=	0.5, n=.0	208;Lca/L	=0.6,n=.0194	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50						
TIME OF PEAK FLOW(HR) =	= 16.33 RUNO	FF VOLUME (	AF) =	327.56								
UNIT-HYDROGRAPH PEAK FI	LOW RATE (CFS)	= 1750	.60			*******************						
TOTAL AREA (ACRES) =	1044.3	PEAK FLO	W RATE (C	FS) =	1750.60	FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 10						
SUBAREA AREA-AVERAGED F		. ,				>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<						
5M = 0.46; 30M = 0.95;	1HK = 1.25;	3HK = 2.03	); OHK = .	2.73; Z4H.	R = 7.50							
******	*****	******	*****	******	*****	****************						
FLOW PROCESS FROM NODE	20112.00 ТО	NODE 201	50.00 TS	CODE =	5.4	FLOW PROCESS FROM NODE 20120.00 TO NODE 20121.00 IS CODE = 21						
>>>>COMPUTE TRAPEZOIDA	AL CHANNEL FLO	OW<<<<				>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS						
>>>>TRAVELTIME THRU SU	JBAREA (EXIST	ING ELEMEN	IT) <<<<			>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<						
		=======			========							
ELEVATION DATA: UPSTREA	AM(FEET) =	1870.00 E	OWNSTREA	M(FEET) =	1850.00	INITIAL SUBAREA FLOW-LENGTH(FEET) = 591.56						
CHANNEL LENGTH THRU SUE	, ,			L SLOPE =	0.0220	ELEVATION DATA: UPSTREAM(FEET) = 3148.00 DOWNSTREAM(FEET) = 2920.00						
CHANNEL BASE (FEET) =												
MANNING'S FACTOR = 0.01			(1) = 5.	00		Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20						
CHANNEL FLOW THRU SUBAR						SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 10.975						
FLOW VELOCITY (FEET/SEC.				= 3.74		* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.464						
TRAVEL TIME (MIN.) = 0						SUBAREA TC AND LOSS RATE DATA(AMC II):						
LONGEST FLOWPATH FROM N	IODE 20100 01	0 TO NODE	20150.0	0 = 136	59.16 FEET.	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC						
*****	*ODD 20100.0					LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)						
*******												
	******					NATURAL FAIR COVER						
FLOW PROCESS FROM NODE	******					"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98						
	20150.00 TO	NODE 201	50.00 IS			"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61						
>>>>ADDITION OF SUBARE	20150.00 TO	NODE 201 E PEAK FLO	50.00 IS	CODE =	81	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000						
>>>>ADDITION OF SUBARE	20150.00 TO 	NODE 201 E PEAK FLO	50.00 IS	CODE =	81	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75						
>>>>ADDITION OF SUBARE	20150.00 TO EA TO MAINLINI 20.71	NODE 201 E PEAK FLC	50.00 IS 	CODE =	81	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000						
>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2  * 100 YEAR RAINFALL INT	20150.00 TO	NODE 201 E PEAK FLC	50.00 IS 	CODE =	81	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75 TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75						
>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2  * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(	20150.00 TO	NODE 201 E PEAK FLC HR) = 2.3	50.00 IS DW<<<<	CODE =	81 	"OPEN BRUSH"  B 5.75 0.61 1.000 66 10.98  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000  SUBAREA RUNOFF(CFS) = 14.75  TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):						
>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/	20150.00 TO	NODE 201  E PEAK FLC  HR) = 2.3	50.00 IS  W<<<< 	CODE =	81  scs	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75 TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75						
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE	20150.00 TO	NODE 201  E PEAK FLC  HR) = 2.3	50.00 IS  W<<<< 	CODE =	81  scs	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75 TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50						
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL	20150.00 TO	NODE 201	50.00 IS W<<<< Fp	Ap (DECIMAL)	81  SCS CN	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75 TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50						
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE	20150.00 TO	NODE 201  E PEAK FLC  HR) = 2.3	50.00 IS  W<<<< 	CODE =	81  scs	"OPEN BRUSH" B 5.75 0.61 1.000 66 10.98 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000 SUBAREA RUNOFF(CFS) = 14.75 TOTAL AREA(ACRES) = 5.75 PEAK FLOW RATE(CFS) = 14.75 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50						

 Date: 04/21/2014
 File name: LR0201ZZ.RES
 Page 13
 Date: 04/21/2014
 File name: LR0201ZZ.RES

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2860.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 401.18 CHANNEL SLOPE = 0.1496
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            14.75
 FLOW VELOCITY (FEET/SEC.) = 7.20 FLOW DEPTH (FEET) = 0.91
 TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 11.90
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20122.00 = 992.74 FEET.
******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20122.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.90
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.299
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    B 6.02
                                  0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 6.02 SUBAREA RUNOFF(CFS) = 14.55
 EFFECTIVE AREA(ACRES) = 11.77 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 11.8 PEAK FLOW RATE (CFS) = 28.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20123.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2860.00 DOWNSTREAM(FEET) = 2800.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 404.41 CHANNEL SLOPE = 0.1484
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 8.42 FLOW DEPTH (FEET) = 1.16
 TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 12.70
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20123.00 = 1397.15 FEET.
*******************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20123.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 12.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.173
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                                 SCS
                                   Fр
                                           Αp
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                          5.11 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.11
                           SUBAREA RUNOFF (CFS) = 11.77
 EFFECTIVE AREA(ACRES) = 16.88 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 16.9
                            PEAK FLOW RATE(CFS) =
                                                 38.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20124.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2720.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 734.74 CHANNEL SLOPE = 0.1089
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 8.12 FLOW DEPTH (FEET) = 1.38
 TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 14.21
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20124.00 = 2131.89 FEET.
******************
 FLOW PROCESS FROM NODE 20124.00 TO NODE 20124.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 14.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.966
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                 SCS
                                         αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                          33.25 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
                           SUBAREA RUNOFF (CFS) = 70.39
 SUBAREA AREA(ACRES) = 33.25
 EFFECTIVE AREA(ACRES) = 50.13 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 50.1
                             PEAK FLOW RATE(CFS) =
                                               106.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
FLOW PROCESS FROM NODE 20124.00 TO NODE 20125.00 IS CODE = 54
...........
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2720.00 DOWNSTREAM(FEET) = 2620.00
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 15 Date: 04/21/2014 File name: LR0201ZZ.RES Page 16

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 932.28 CHANNEL SLOPE = 0.1073
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 106.12
 FLOW VELOCITY (FEET/SEC.) = 10.36 FLOW DEPTH (FEET) = 2.02
 TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 15.71
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20125.00 = 3064.17 FEET.
FLOW PROCESS FROM NODE 20125.00 TO NODE 20125.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 15.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.793
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Дp
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           36.51
                    В
                                    0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 36.51
                           SUBAREA RUNOFF (CFS) = 71.59
 EFFECTIVE AREA(ACRES) = 86.64 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 86.6 PEAK FLOW RATE (CFS) = 169.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20125.00 TO NODE 20126.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2620.00 DOWNSTREAM(FEET) = 2600.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1333.93 CHANNEL SLOPE = 0.0150
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 169.90
 FLOW VELOCITY (FEET/SEC.) = 5.58 FLOW DEPTH (FEET) = 3.49
 TRAVEL TIME (MIN.) = 3.98 Tc (MIN.) = 19.70
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20126.00 = 4398.10 FEET.
*********************
 FLOW PROCESS FROM NODE 20126.00 TO NODE 20126.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 19.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.439
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                 SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                            60.59
                                  0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 60.59
                              SUBAREA RUNOFF (CFS) = 99.51
 EFFECTIVE AREA(ACRES) = 147.23 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 147.2
                             PEAK FLOW RATE(CFS) =
                                                    241.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20126.00 TO NODE 20127.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1404.24 CHANNEL SLOPE = 0.1282
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               241.79
 FLOW VELOCITY (FEET/SEC.) = 11.03 FLOW DEPTH (FEET) = 1.00
 TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 21.82
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20127.00 = 5802.34 FEET.
******************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20127.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 21.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.294
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 45.37 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 45.37
                             SUBAREA RUNOFF (CFS) = 68.58
 EFFECTIVE AREA(ACRES) = 192.60 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 192.6
                               PEAK FLOW RATE(CFS) =
                                                    291.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.18; 6HR = 3.11; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20128.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.58 CHANNEL SLOPE = 0.1444
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 291.14
 FLOW VELOCITY (FEET/SEC.) = 10.78 FLOW DEPTH (FEET) = 0.85
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 18

```
TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 23.74
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20128.00 = 7048.92 FEET.
FLOW PROCESS FROM NODE 20128.00 TO NODE 20128.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 23.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.180
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                            27.94
                                     0.61
                                            1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           8.51
                                     0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930
 SUBAREA AREA(ACRES) = 36.45
                             SUBAREA RUNOFF (CFS) = 52.07
 EFFECTIVE AREA(ACRES) = 229.05 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.99
 TOTAL AREA(ACRES) = 229.0
                              PEAK FLOW RATE(CFS) =
                                                   323.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*****************
 FLOW PROCESS FROM NODE 20128.00 TO NODE 20129.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2120.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1393.78 CHANNEL SLOPE = 0.0861
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 323.52
 FLOW VELOCITY (FEET/SEC.) = 9.54 FLOW DEPTH (FEET) = 1.06
 TRAVEL TIME (MIN.) = 2.43 Tc (MIN.) = 26.18
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20129.00 = 8442.70 FEET.
*********************
 FLOW PROCESS FROM NODE 20129.00 TO NODE 20129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 26.18
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.056
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fр
                                             Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                         18.57
                                            1.000
                                     0.61
                                                  66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                            10.38
                                     0.75
                                            0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892
```

```
SUBAREA AREA(ACRES) = 28.95
                             SUBAREA RUNOFF (CFS) = 38.42
 EFFECTIVE AREA(ACRES) = 258.00 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.98
 TOTAL AREA(ACRES) = 258.0
                               PEAK FLOW RATE(CFS) =
                                                 336.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 10129.00 TO NODE 20130.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 1995.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2018.40 CHANNEL SLOPE = 0.0619
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 336.38
 FLOW VELOCITY (FEET/SEC.) = 8.71 FLOW DEPTH (FEET) = 1.19
 TRAVEL TIME (MIN.) = 3.86 Tc (MIN.) = 30.04
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20130.00 = 10461.10 FEET.
******************
 FLOW PROCESS FROM NODE 20130.00 TO NODE 20130.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 30.04
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.893
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fр
                                             Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                            28.04
                                      0.75
                                             0.900
                                                    56
                     В
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            51.49
                                      0.61
                                           1.000
                                                    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                            30.71
                                      0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 110.24
                             SUBAREA RUNOFF (CFS) = 127.90
 EFFECTIVE AREA(ACRES) = 368.24 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95
 TOTAL AREA(ACRES) = 368.2
                              PEAK FLOW RATE (CFS) = 426.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.07; 6HR = 2.84; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20130.00 TO NODE 20148.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1995.00 DOWNSTREAM(FEET) = 1925.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.14 CHANNEL SLOPE = 0.0562
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 19 Date: 04/21/2014 File name: LR0201ZZ.RES

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 426.43
 FLOW VELOCITY (FEET/SEC.) = 9.23 FLOW DEPTH (FEET) = 1.41
 TRAVEL TIME (MIN.) = 2.25 Tc (MIN.) = 32.29
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 32.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.813
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                             Ар
                                     Fр
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    в 19.93
                                   0.75
                                           0.900
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 20.58
                             SUBAREA RUNOFF (CFS) = 21.24
 EFFECTIVE AREA(ACRES) = 388.82 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 388.8
                             PEAK FLOW RATE (CFS) = 426.43
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
**********************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 32.29
 RAINFALL INTENSITY (INCH/HR) = 1.81
 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64
 AREA-AVERAGED Ap = 0.95
 EFFECTIVE STREAM AREA(ACRES) = 388.82
 TOTAL STREAM AREA(ACRES) = 388.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 426.43
*******************
 FLOW PROCESS FROM NODE 20140.00 TO NODE 20141.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 823.61
 ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.588
```

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.190
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                SCS Tc
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   B 8.14 0.61 1.000 66 12.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 18.87
 TOTAL AREA (ACRES) = 8.14 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.53; 6HR = 2.22; 24HR = 4.71
******************
 FLOW PROCESS FROM NODE 20141.00 TO NODE 20142.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 2690.00 DOWNSTREAM(FEET) = 2560.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 610.78 CHANNEL SLOPE = 0.2128
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            18.87
 FLOW VELOCITY (FEET/SEC.) = 8.66 FLOW DEPTH (FEET) = 0.93
 TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 13.76
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20142.00 = 1434.39 FEET.
FLOW PROCESS FROM NODE 20142.00 TO NODE 20142.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 13.76
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.024
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                                SCS
                                         αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   В
                          15.44 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 15.44
                           SUBAREA RUNOFF(CFS) = 33.49
 EFFECTIVE AREA(ACRES) = 23.58 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 23.6
                            PEAK FLOW RATE(CFS) =
                                                 51.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
*****************
 FLOW PROCESS FROM NODE 20142.00 TO NODE 20143.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2560.00 DOWNSTREAM(FEET) = 2420.00
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 21 Date: 04/21/2014 File name: LR0201ZZ.RES Page 22

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 771.13 CHANNEL SLOPE = 0.1816
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 10.54 FLOW DEPTH (FEET) = 1.39
 TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 14.98
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20143.00 = 2205.52 FEET.
FLOW PROCESS FROM NODE 20143.00 TO NODE 20143.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 14.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.874
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Дp
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                            22.70
                                     0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 22.70
                             SUBAREA RUNOFF (CFS) = 46.16
 EFFECTIVE AREA(ACRES) = 46.28 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 46.3 PEAK FLOW RATE (CFS) =
                                                   94.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20143.00 TO NODE 20144.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1310.58 CHANNEL SLOPE = 0.1373
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 94.12
 FLOW VELOCITY (FEET/SEC.) = 11.01 FLOW DEPTH (FEET) = 1.85
 TRAVEL TIME (MIN.) = 1.98 Tc (MIN.) = 16.97
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20144.00 = 3516.10 FEET.
*********************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20144.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 16.97
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.667
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             Aр
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 61.27
                                  0.61
                                            1.000 66
 RESIDENTIAL
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984
                         SUBAREA RUNOFF(CFS) = 133.40
 SUBAREA AREA(ACRES) = 72.52
 EFFECTIVE AREA(ACRES) = 118.80 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 118.8
                             PEAK FLOW RATE (CFS) = 218.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20145.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1185.29 CHANNEL SLOPE = 0.0759
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 218.91
 FLOW VELOCITY (FEET/SEC.) = 11.15 FLOW DEPTH (FEET) = 2.12
 TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 18.74
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20145.00 = 4701.39 FEET.
************************
 FLOW PROCESS FROM NODE 20145.00 TO NODE 20145.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 18.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.513
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Aр
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           27.90
                                    0.61
                                          1.000
                                                  66
 RESIDENTIAL
                 В 18.45
                                    0.75 0.900
                                                  56
 ".4 DWELLING/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960
 SUBAREA AREA(ACRES) = 46.35 SUBAREA RUNOFF(CFS) = 78.22
 EFFECTIVE AREA(ACRES) = 165.15 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) = 165.1 PEAK FLOW RATE (CFS) =
                                                 280.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.15; 6HR = 3.04; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20145.00 TO NODE 20146.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2065.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1106.66 CHANNEL SLOPE = 0.0768
```

File name: LR020177.RFS

Page 24

B 11.25 0.75 0.900 56

".4 DWELLING/ACRE"

Date: 04/21/2014

```
CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 280.63
 FLOW VELOCITY (FEET/SEC.) = 11.94 FLOW DEPTH (FEET) = 2.40
 TRAVEL TIME (MIN.) = 1.54 Tc (MIN.) = 20.28
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20146.00 = 5808.05 FEET.
******************
 FLOW PROCESS FROM NODE 20146.00 TO NODE 20146.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 20.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.396
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В 5.66
                                    0.61
                                          1.000
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 28.22
                                    0.75
                                         0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917
 SUBAREA AREA(ACRES) = 33.88
                         SUBAREA RUNOFF (CFS) = 52.84
 EFFECTIVE AREA(ACRES) = 199.03 AREA-AVERAGED Fm(INCH/HR) = 0.63
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 199.0
                           PEAK FLOW RATE(CFS) =
                                                 316.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20146.00 TO NODE 20147.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2065.00 DOWNSTREAM(FEET) = 1980.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1084.55 CHANNEL SLOPE = 0.0784
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 316.14
 FLOW VELOCITY (FEET/SEC.) = 12.43 FLOW DEPTH (FEET) = 2.53
 TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 21.74
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20147.00 = 6892.60 FEET.
******************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20147.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                            αA
                                                 SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE" B
                           15.70
                                    0.75
                                           0.900 56
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA(ACRES) = 15.70
                            SUBAREA RUNOFF(CFS) = 22.97
 EFFECTIVE AREA(ACRES) = 214.73 AREA-AVERAGED Fm(INCH/HR) = 0.63
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 214.7
                              PEAK FLOW RATE (CFS) =
                                                   321.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20148.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1925.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 934.91 CHANNEL SLOPE = 0.0588
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              321.65
 FLOW VELOCITY (FEET/SEC.) = 11.24 FLOW DEPTH (FEET) = 2.73
 TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 23.12
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20148.00 = 7827.51 FEET.
*******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 23.12
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.215
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                           14.97 0.75 0.900
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA(ACRES) = 14.97
                          SUBAREA RUNOFF (CFS) = 20.77
 EFFECTIVE AREA(ACRES) = 229.70 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.96
 TOTAL AREA (ACRES) = 229.7 PEAK FLOW RATE (CFS) =
                                                 326.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE =
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.12
 RAINFALL INTENSITY (INCH/HR) = 2.21
 AREA-AVERAGED Fm(INCH/HR) = 0.64
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 26

```
AREA-AVERAGED Fp (INCH/HR) = 0.66
 AREA-AVERAGED Ap = 0.96
 EFFECTIVE STREAM AREA(ACRES) = 229.70
 TOTAL STREAM AREA(ACRES) = 229.70
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
  STREAM
         O Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                          (ACRES) NODE
        426.43 32.29 1.813 0.64(0.61) 0.95 388.8 20120.00
   1
         326.24 23.12 2.215 0.66(0.64) 0.96
                                          229.7 20140.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm)
                                    Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         733.66 23.12 2.215 0.65(0.62) 0.95 508.1 20140.00
         669.52 32.29 1.813 0.65(0.62) 0.95 618.5 20120.00
    2
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 733.66 Tc (MIN.) = 23.12
 EFFECTIVE AREA(ACRES) = 508.11 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 618.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20149.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1925.00 DOWNSTREAM(FEET) = 1900.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 764.60 CHANNEL SLOPE = 0.0327
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 733.66
 FLOW VELOCITY (FEET/SEC.) = 10.95 FLOW DEPTH (FEET) = 3.80
 TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 24.29
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20149.00 = 12471.84 FEET.
******************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20149.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 24.29
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.151
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           αA
                                                 SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 20.34
                                    0.75
                                           0.900
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  B 0.62
                                    0.75
                                           0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 20.96
                            SUBAREA RUNOFF (CFS) = 28.00
 EFFECTIVE AREA(ACRES) = 529.07 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95
 TOTAL AREA(ACRES) = 639.5
                             PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20150.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1212.57 CHANNEL SLOPE = 0.0412
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             733.66
 FLOW VELOCITY (FEET/SEC.) = 11.90 FLOW DEPTH (FEET) = 3.59
 TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 25.99
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 25.99
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.065
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 8.58
                                    0.75 0.900
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA AREA(ACRES) = 8.68 SUBAREA RUNOFF(CFS) = 10.89
 EFFECTIVE AREA(ACRES) = 537.75 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95
                             PEAK FLOW RATE (CFS) = 733.66
 TOTAL AREA (ACRES) = 648.2
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 71
______
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<>>>>
______
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.24;3H= 2.14;6H= 3.00;24H= 7.46
```

File name: LR0201ZZ.RES

Page 28

Date: 04/21/2014

```
S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.62; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0489; Lca/L=0.4,n=.0438; Lca/L=0.5,n=.0402; Lca/L=0.6,n=.0375
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 197.89
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 747.48
 TOTAL PEAK FLOW RATE (CFS) = 747.48 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 733.66
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 733.66)
 PEAK FLOW RATE (CFS) USED = 747.48
*************************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 11
      ______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 747.48
                               Tc(MIN.) = 35.23
 AREA-AVERAGED Fm (INCH/HR) = 0.62 Ybar = 0.54
 TOTAL AREA (ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1750.60 Tc (MIN.) = 20.71
 AREA-AVERAGED Fm(INCH/HR) = 0.60 Ybar = 0.53
 TOTAL AREA (ACRES) = 1052.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.19;6H= 3.11;24H= 7.51
 S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.61; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1700.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0489; Lca/L=0.4,n=.0438; Lca/L=0.5,n=.0402; Lca/L=0.6,n=.0375
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 524.96
 PEAK FLOW RATE (CFS) = 1868.80
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1850.00 DOWNSTREAM(FEET) = 1785.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1753.77 CHANNEL SLOPE = 0.0371
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1868.80
 FLOW VELOCITY (FEET/SEC.) = 32.85 FLOW DEPTH (FEET) = 3.39
 TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 36.12
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
*******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 36.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.695
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                  B 24.58 0.75 0.900
 ".4 DWELLING/ACRE"
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA (ACRES) = 24.58
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.18;6H= 3.11;24H= 7.51
 S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.61; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0451; Lca/L=0.4, n=.0404; Lca/L=0.5, n=.0371; Lca/L=0.6, n=.0346
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 531.22
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1834.00
 TOTAL AREA(ACRES) = 1725.0
                            PEAK FLOW RATE (CFS) = 1868.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.33
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20151.DNA
_______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1725.0 TC (MIN.) = 36.12
      Date: 04/21/2014 File name: LR0201ZZ.RES
```

FLOW PROCESS FROM NODE 20150.00 TO NODE 20151.00 IS CODE = 54

Date: 04/21/2014 File name: LR020177.RFS Page 29

AREA-AVERAGED Fm(INCH/HR)= 0.61 Ybar = 0.53 PEAK FLOW RATE(CFS) = 1868.80

\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0201ZZ.RES
 Page 31
 Date: 04/21/2014
 File name: LR0201ZZ.RES
 Page 32

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 20274

\* 100-YR HC ULTIMATE CONDITION SEPTEMBER 2013 TMULI

\*

FILE NAME: LR0202ZZ.DAT

TIME/DATE OF STUDY: 09:42 10/03/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGY AND HIDRAULIC MODEL INFORMATION.

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20200.00 TO NODE 20201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 508.83 ELEVATION DATA: UPSTREAM(FEET) = 1945.00 DOWNSTREAM(FEET) = 1935.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.936 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.471 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" A 4.64 0.98 0.600 32 10.94 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA RUNOFF(CFS) = 12.05 TOTAL AREA (ACRES) = 4.64 PEAK FLOW RATE (CFS) = 12.05 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.12; 6HR = 2.96; 24HR = 7.50 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20201.00 TO NODE 20202.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA \_\_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1935.00 DOWNSTREAM NODE ELEVATION (FEET) = 1930.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 620.72 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700

File name: LR0202ZZ.RES

Page 2

Date: 04/21/2014

```
"3-4 DWELLINGS/ACRE" A 11.02 0.98 0.600 32
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.961
                                                                                  MOBILE HOME PARK A 0.23 0.98 0.250 32
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.593
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA (ACRES) = 11.25 SUBAREA RUNOFF (CFS) = 22.89
     LAND USE
                                                                                  EFFECTIVE AREA(ACRES) = 22.21 AREA-AVERAGED Fm(INCH/HR) = 0.58
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.32 0.98 0.600 32
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                  TOTAL AREA (ACRES) = 22.2 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.81
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.12
 AVERAGE FLOW DEPTH (FEET) = 0.63 FLOOD WIDTH (FEET) = 35.63
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.32 Tc (MIN.) = 14.25
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 6.32 SUBAREA RUNOFF (CFS) = 13.51
                                                                                  DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 18.37
 EFFECTIVE AREA(ACRES) = 10.96 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.33 DEPTH*VELOCITY (FT*FT/SEC.) = 3.33
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
                                                                                  LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20203.00 = 1499.05 FEET.
 TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) =
                                                          23.44
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW PROCESS FROM NODE 20203.00 TO NODE 20204.00 IS CODE = 63
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.76; 24HR = 7.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.66 FLOOD WIDTH(FEET) = 39.52
 FLOW VELOCITY (FEET/SEC.) = 3.22 DEPTH*VELOCITY (FT*FT/SEC) = 2.13
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20202.00 = 1129.55 FEET.
                                                                                  STREET HALFWIDTH (FEET) = 32.00
*****
 FLOW PROCESS FROM NODE 20202.00 TO NODE 20203.00 IS CODE = 63
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1930.00 DOWNSTREAM ELEVATION(FEET) = 1910.00
 STREET LENGTH (FEET) = 369.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.60
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.88
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.49
                                                                                  RESIDENTIAL
   HALFSTREET FLOOD WIDTH (FEET) = 16.57
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.94
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.91
 STREET FLOW TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 15.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.839
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1910.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
 STREET LENGTH (FEET) = 418.06 CURB HEIGHT (INCHES) = 8.0
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 58.61
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  HALFSTREET FLOOD WIDTH (FEET) = 22.12
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.77
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.46
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 16.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.712
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" A 6.00 0.98 0.600 32
 MOBILE HOME PARK A 6.97 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 SUBAREA AREA (ACRES) = 12.97 SUBAREA RUNOFF (CFS) = 26.97
 EFFECTIVE AREA(ACRES) = 35.18 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) = 69.56
       Date: 04/21/2014
                     File name: LR0202ZZ.RES
                                                     Page 4
```

45.12

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.68
 FLOW VELOCITY(FEET/SEC.) = 6.00 DEPTH*VELOCITY(FT*FT/SEC.) = 3.79
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20204.00 = 1917.11 FEET.
********************
 FLOW PROCESS FROM NODE 20204.00 TO NODE 20205.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1895.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 555.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.25
 STREET FLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 17.96
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.577
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 8.31
                                        0.98 0.600 32
 MOBILE HOME PARK A 8.55 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.423
 SUBAREA AREA(ACRES) = 16.86 SUBAREA RUNOFF(CFS) = 32.86
 EFFECTIVE AREA(ACRES) = 52.04 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 52.0 PEAK FLOW RATE (CFS) =
                                                         98.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.66
 FLOW VELOCITY(FEET/SEC.) = 6.52 DEPTH*VELOCITY(FT*FT/SEC.) = 4.56
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20205.00 = 2472.11 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1875.00 DOWNSTREAM ELEVATION (FEET) = 1855.00
 STREET LENGTH (FEET) = 568.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 30.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.56
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.68
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 19.41
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.461
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK A 4.58 0.98 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.65 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA (ACRES) = 6.23 SUBAREA RUNOFF (CFS) = 11.92
 EFFECTIVE AREA (ACRES) = 58.27 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 58.3 PEAK FLOW RATE (CFS) = 104.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 30.22
 FLOW VELOCITY (FEET/SEC.) = 6.55 DEPTH*VELOCITY (FT*FT/SEC.) = 4.68
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20206.00 = 3040.11 FEET.
FLOW PROCESS FROM NODE 20206.00 TO NODE 20214.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1855.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
 STREET LENGTH (FEET) = 411.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 6

FLOW PROCESS FROM NODE 20205.00 TO NODE 20206.00 IS CODE = 63

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.73
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 30.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.68
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.77
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 20.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.386
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                     A 1.68 0.98 0.250 32
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.62 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344
 SUBAREA AREA (ACRES) = 2.30 SUBAREA RUNOFF (CFS) = 4.24
 EFFECTIVE AREA(ACRES) = 60.57 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.47
 TOTAL AREA(ACRES) = 60.6 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.46
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 29.91
 FLOW VELOCITY (FEET/SEC.) = 6.65 DEPTH*VELOCITY (FT*FT/SEC.) = 4.73
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET.
*********************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 20.43
 RAINFALL INTENSITY (INCH/HR) = 2.39
 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.97
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 60.57
 TOTAL STREAM AREA(ACRES) = 60.57
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 104.93
******************
 FLOW PROCESS FROM NODE 20210.00 TO NODE 20211.00 IS CODE = 21
```

```
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 940.61
 ELEVATION DATA: UPSTREAM(FEET) = 1875.00 DOWNSTREAM(FEET) = 1850.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.163
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.106
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                              Аp
                                                      SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 7.95 0.98 0.600 32 13.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 18.04
 TOTAL AREA (ACRES) = 7.95 PEAK FLOW RATE (CFS) = 18.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.29
FLOW PROCESS FROM NODE 20211.00 TO NODE 20212.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1850.00 DOWNSTREAM ELEVATION(FEET) = 1846.00
 STREET LENGTH (FEET) = 247.17 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.83
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.43
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
 STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 14.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.947
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             4.82 0.98 0.600
                                                       32
                     A
 MOBILE HOME PARK A
                             0.55 0.98 0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 8

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564
 SUBAREA AREA (ACRES) = 5.37 SUBAREA RUNOFF (CFS) = 11.59
 EFFECTIVE AREA(ACRES) = 13.32 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 13.3 PEAK FLOW RATE (CFS) = 28.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.30
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.68
 FLOW VELOCITY(FEET/SEC.) = 3.69 DEPTH*VELOCITY(FT*FT/SEC.) = 1.90
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20212.00 = 1187.78 FEET.
*************
 FLOW PROCESS FROM NODE 20212.00 TO NODE 20213.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1846.00 DOWNSTREAM ELEVATION(FEET) = 1843.00
 STREET LENGTH (FEET) = 253.21 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 21.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.01
 STREET FLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 15.55
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.810
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESTDENTIAL
                                        0.98 0.600 32
 "3-4 DWELLINGS/ACRE" A 2.35
                               3.23
                                                0.250 32
 MOBILE HOME PARK
                      A
                                        0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.397
 SUBAREA AREA(ACRES) = 5.58 SUBAREA RUNOFF(CFS) = 12.17
 EFFECTIVE AREA(ACRES) = 18.90 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = 39.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.33
```

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
 FLOW VELOCITY (FEET/SEC.) = 3.70 DEPTH*VELOCITY (FT*FT/SEC.) = 2.16
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20213.00 = 1440.99 FEET.
*******************
 FLOW PROCESS FROM NODE 20213.00 TO NODE 20214.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1843.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
 STREET LENGTH (FEET) = 294.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  41.41
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.17
 STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 16.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.672
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.63 0.98 0.600 32
 MOBILE HOME PARK
                             1.65 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.347
 SUBAREA AREA (ACRES) = 2.28 SUBAREA RUNOFF (CFS) = 4.79
 EFFECTIVE AREA(ACRES) = 21.18 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51
 TOTAL AREA(ACRES) = 21.2 PEAK FLOW RATE(CFS) =
                                                        41.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.99
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.61 HALFSTREET FLOOD WIDTH (FEET) = 23.26
 FLOW VELOCITY (FEET/SEC.) = 3.59 DEPTH*VELOCITY (FT*FT/SEC.) = 2.17
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20214.00 = 1735.24 FEET.
*******************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 9

File name: LR0202ZZ.RES

Date: 04/21/2014

\*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES< STREET FLOW DEPTH (FEET) = 0.82HALFSTREET FLOOD WIDTH (FEET) = 39.52 TOTAL NUMBER OF STREAMS = 2 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.62 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 6.23 TIME OF CONCENTRATION (MIN.) = 16.92 STREET FLOW TRAVEL TIME (MIN.) = 2.64 Tc (MIN.) = 19.56 RAINFALL INTENSITY (INCH/HR) = 2.67\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.449 AREA-AVERAGED Fm(INCH/HR) = 0.50SUBAREA LOSS RATE DATA (AMC II): AREA-AVERAGED Fp(INCH/HR) = 0.98DEVELOPMENT TYPE/ SCS SOIL AREA Fр GROUP (ACRES) (INCH/HR) (DECIMAL) CN AREA-AVERAGED Ap = 0.51LAND USE EFFECTIVE STREAM AREA(ACRES) = 21.18 RESIDENTIAL TOTAL STREAM AREA(ACRES) = 21.18 "3-4 DWELLINGS/ACRE" A 18.86 0.98 0.600 32 MOBILE HOME PARK A 19.95 0.98 0.250 32 PEAK FLOW RATE (CFS) AT CONFLUENCE = 41.44 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98 \*\* CONFLUENCE DATA \*\* SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.420 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER SUBAREA AREA (ACRES) = 38.81 SUBAREA RUNOFF (CFS) = 71.25 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE EFFECTIVE AREA(ACRES) = 110.15 AREA-AVERAGED Fm(INCH/HR) = 0.45 1 104.93 20.43 2.386 0.97(0.46) 0.47 60.6 20200.00 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.4641.44 16.92 2.672 0.98(0.50) 0.51 21.2 20210.00 TOTAL AREA (ACRES) = 120.6 PEAK FLOW RATE (CFS) = 198.21 2 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): CONFLUENCE FORMULA USED FOR 2 STREAMS. 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50\*\* PEAK FLOW RATE TABLE \*\* END OF SUBAREA STREET FLOW HYDRAULICS: STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 40.68 FLOW VELOCITY (FEET/SEC.) = 7.91 DEPTH\*VELOCITY (FT\*FT/SEC.) = 6.65 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 141.24 16.92 2.672 0.97(0.47) 0.48 71.3 20210.00 2 140.92 20.43 2.386 0.97(0.47) 0.48 81.8 20200.00 \*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: PEAK FLOW RATE (CFS) = 141.24 Tc (MIN.) = 16.92 \*\* PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE \*\* EFFECTIVE AREA(ACRES) = 71.34 AREA-AVERAGED Fm(INCH/HR) = 0.47 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.48 ASSUME FULL-FLOWING PIPELINE TOTAL AREA(ACRES) = 81.8 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.09LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET. PIPE-FLOW(CFS) = 41.17PIPEFLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 18.45 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.536 FLOW PROCESS FROM NODE 20214.00 TO NODE 20215.00 IS CODE = 63 SUBAREA AREA(ACRES) = 38.81 SUBAREA RUNOFF(CFS) = 74.27 TOTAL AREA (ACRES) = 120.6 PEAK FLOW RATE (CFS) = 206.81 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 13 USED) <<<< SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): \_\_\_\_\_ 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1793.00 STREETFLOW HYDRAULICS BASED ON MAINLINE TC : STREET LENGTH (FEET) = 1205.58 CURB HEIGHT (INCHES) = 8.0 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 165.63 STREET HALFWIDTH (FEET) = 32.00\*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 STREET FLOW DEPTH(FEET) = 0.80INSIDE STREET CROSSFALL(DECIMAL) = 0.020 HALFSTREET FLOOD WIDTH (FEET) = 38.85 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.48 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 6.01 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 \*\* PEAK FLOW RATE TABLE \*\* Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82 1 206.81 18.45 2.536 0.97(0.45) 0.46 110.2 20210.00 2 198.94 21.97 2.284 0.98(0.45) 0.46 120.6 20200.00 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.89 NEW PEAK FLOW DATA ARE:

```
PEAK FLOW RATE (CFS) = 206.81 Tc (MIN.) = 18.45
 AREA-AVERAGED Fm (INCH/HR) = 0.45 AREA-AVERAGED Fp (INCH/HR) = 0.97
                                                                                *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 AREA-AVERAGED Ap = 0.46 EFFECTIVE AREA(ACRES) = 110.15
                                                                                      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20215.00 = 4656.69 FEET.
                                                                                SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 FLOW PROCESS FROM NODE 20215.00 TO NODE 20216.00 IS CODE = 63
                                                                                ASSUME FULL-FLOWING PIPELINE
______
                                                                                PIPE-FLOW VELOCITY (FEET/SEC.) = 14.38
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                PIPE-FLOW(CFS) =
                                                                                                 85.46
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 2.00 Tc (MIN.) = 20.45
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.384
                                                                                SUBAREA AREA (ACRES) = 50.04 SUBAREA RUNOFF (CFS) = 86.16
 UPSTREAM ELEVATION(FEET) = 1793.00 DOWNSTREAM ELEVATION(FEET) = 1740.00
 STREET LENGTH (FEET) = 1725.28 CURB HEIGHT (INCHES) = 8.0
                                                                                TOTAL AREA (ACRES) = 170.6 PEAK FLOW RATE (CFS) = 273.59
 STREET HALFWIDTH (FEET) = 32.00
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 188.13
                                                                                  ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET FLOW DEPTH (FEET) = 0.85
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 41.35
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.19
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.14
                                                                                ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 247.43
                                                                                                                        Ар Ае
   ***STREET FLOWING FULL***
                                                                                 STREAM Q Tc Intensity Fp(Fm)
                                                                                                                                      HEADWATER
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 1 277.91 20.45 2.384 0.97(0.46) 0.47 160.2 20210.00
   STREET FLOW DEPTH (FEET) = 0.92
                                                                                   2 261.64 24.10 2.161 0.97(0.46) 0.47 170.6 20200.00
   HALFSTREET FLOOD WIDTH (FEET) = 44.59
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.80
                                                                                NEW PEAK FLOW DATA ARE:
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.16
                                                                                PEAK FLOW RATE (CFS) = 277.91 Tc (MIN.) = 20.45
 STREET FLOW TRAVEL TIME (MIN.) = 3.69 Tc (MIN.) = 22.14
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.97
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.273
                                                                                AREA-AVERAGED Ap = 0.47 EFFECTIVE AREA(ACRES) = 160.19
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20216.00 = 6381.97 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                αA
                                                                               ******************
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                FLOW PROCESS FROM NODE 20216.00 TO NODE 20232.00 IS CODE = 63
 "3-4 DWELLINGS/ACRE" A 24.17
                                        0.98
                                                0.600 32
                                                                               _______
                              9.62
                                        0.98
                                                0.600 32
 SCHOOL
                      A
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 MOBILE HOME PARK
                      A 14.92
                                        0.98
                                                0.250 32
                                                                                >>>> (STREET TABLE SECTION # 13 USED) <<<<
                      A
                                                0.100 32
 COMMERCIAL
                             0.89
                                        0.98
                                                                               ______
 RESIDENTIAL
                                                                                UPSTREAM ELEVATION(FEET) = 1740.00 DOWNSTREAM ELEVATION(FEET) = 1739.00
 "3-4 DWELLINGS/ACRE" B 0.13
                                        0.75 0.600 56
                                                                                STREET LENGTH (FEET) = 1052.00 CURB HEIGHT (INCHES) = 8.0
             в 0.31
                                                                                STREET HALFWIDTH (FEET) = 32.00
                                       0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.484
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 SUBAREA AREA(ACRES) = 50.04 SUBAREA RUNOFF(CFS) = 81.17
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 EFFECTIVE AREA(ACRES) = 160.19 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 170.6 PEAK FLOW RATE (CFS) =
                                                        257.63
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.93 HALFSTREET FLOOD WIDTH(FEET) = 45.08
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 7.90 DEPTH*VELOCITY (FT*FT/SEC.) = 7.34
                                                                                  ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 13 Date: 04/21/2014 File name: LR0202ZZ.RES Page 14

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.66
   HALFSTREET FLOOD WIDTH (FEET) = 81.82
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.78
 STREET FLOW TRAVEL TIME (MIN.) = 7.71 Tc (MIN.) = 28.16
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.968
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                        A
                                  0.63
                                           0.98
                                                   0.250
                                                            32
                         B
 COMMERCIAL
                                  1.46
                                           0.75
                                                    0.100
                                                           56
 MOBILE HOME PARK
                        В
                                  4.91
                                           0.75
                                                    0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.10
                                           0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.360
 SUBAREA AREA(ACRES) = 11.10
                                SUBAREA RUNOFF(CFS) = 16.94
 EFFECTIVE AREA(ACRES) = 171.29 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.49
 TOTAL AREA(ACRES) = 181.7
                                PEAK FLOW RATE (CFS) = 277.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.65 HALFSTREET FLOOD WIDTH(FEET) = 80.97
 FLOW VELOCITY (FEET/SEC.) = 2.26 DEPTH*VELOCITY (FT*FT/SEC.) = 3.72
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.94
 PIPE-FLOW(CFS) = 218.33
 PIPEFLOW TRAVEL TIME (MIN.) = 3.55 Tc (MIN.) = 24.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.166
 SUBAREA AREA (ACRES) = 11.10 SUBAREA RUNOFF (CFS) = 18.92
 TOTAL AREA (ACRES) = 181.7
                                PEAK FLOW RATE (CFS) = 277.91
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 59.58
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.00
   HALFSTREET FLOOD WIDTH (FEET) = 48.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.51
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
*******************
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
```

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.01
 RAINFALL INTENSITY (INCH/HR) = 2.17
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.96
 AREA-AVERAGED Ap = 0.49
 EFFECTIVE STREAM AREA(ACRES) = 171.29
 TOTAL STREAM AREA(ACRES) = 181.70
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 277.91
******************
 FLOW PROCESS FROM NODE 20220.00 TO NODE 20221.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 598.74
 ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1925.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.057
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.274
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                            0.600
                     A
                           5.11 0.98
                                                  32 12.06
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 12.37
 TOTAL AREA (ACRES) = 5.11 PEAK FLOW RATE (CFS) = 12.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*******************
 FLOW PROCESS FROM NODE 20221.00 TO NODE 20222.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 1925.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1915.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 551.44
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.978
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fр
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   A
                           5.86 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

File name: LR0202ZZ.RES

Page 16

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.67
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.46
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 AVERAGE FLOW DEPTH(FEET) = 0.57 FLOOD WIDTH(FEET) = 28.91
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.06 Tc (MIN.) = 14.12
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA(ACRES) = 5.86 SUBAREA RUNOFF(CFS) = 12.62
                                                                                   DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.84
 EFFECTIVE AREA(ACRES) = 10.97 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                   FLOW VELOCITY (FEET/SEC.) = 5.19 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
                                                                                   LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20223.00 = 1504.18 FEET.
 TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) =
                                                            23.63
                                                                                  *******************
                                                                                    FLOW PROCESS FROM NODE 20223.00 TO NODE 20224.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
 DEPTH (FEET) = 0.60 FLOOD WIDTH (FEET) = 32.65
                                                                                  ______
 FLOW VELOCITY (FEET/SEC.) = 4.57 DEPTH*VELOCITY (FT*FT/SEC) = 2.75
                                                                                   UPSTREAM ELEVATION(FEET) = 1905.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20222.00 = 1150.18 FEET.
                                                                                   STREET LENGTH (FEET) = 253.00 CURB HEIGHT (INCHES) = 6.0
                                                                                   STREET HALFWIDTH (FEET) = 18.00
****************
 FLOW PROCESS FROM NODE 20222.00 TO NODE 20223.00 IS CODE = 63
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1915.00 DOWNSTREAM ELEVATION(FEET) = 1905.00
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 354.00 CURB HEIGHT (INCHES) = 6.0
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                       52.32
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREET FLOW DEPTH (FEET) = 0.54
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 19.78
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.11
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.27
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 16.06
                                                                                   * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.756
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    SUBAREA LOSS RATE DATA(AMC II):
   ***STREET FLOWING FULL***
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                                           SCS
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.51
                                                                                   MOBILE HOME PARK
                                                                                                        A 2.51 0.98 0.250
   HALFSTREET FLOOD WIDTH (FEET) = 18.26
                                                                                   RESIDENTIAL
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.72
                                                                                   "3-4 DWELLINGS/ACRE" A 4.90 0.98 0.600
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.38
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481
 STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 15.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.830
                                                                                   SUBAREA AREA (ACRES) = 7.41 SUBAREA RUNOFF (CFS) = 15.25
                                                                                   EFFECTIVE AREA(ACRES) = 29.53 AREA-AVERAGED Fm(INCH/HR) = 0.56
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.57
                                                Ap SCS
                                                                                   TOTAL AREA (ACRES) = 29.5 PEAK FLOW RATE (CFS) = 58.48
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 11.15 0.98 0.600 32
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 11.15 SUBAREA RUNOFF (CFS) = 22.53
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 22.12 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                   DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.58
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
                                                                                   FLOW VELOCITY (FEET/SEC.) = 6.36 DEPTH*VELOCITY (FT*FT/SEC.) = 3.51
 TOTAL AREA (ACRES) = 22.1 PEAK FLOW RATE (CFS) = 44.69
                                                                                   LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20224.00 = 1757.18 FEET.
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 17

File name: LR0202ZZ.RES Page 18

WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20225.00 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20225.00 = 2080.68 FEET.

FLOW PROCESS FROM NODE 20225.00 TO NODE 20226.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014

File name: LR0202ZZ.RES Page 19 >>>> (STREET TABLE SECTION # 5 USED) <<<<

INSIDE STREET CROSSFALL (DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

UPSTREAM ELEVATION(FEET) = 1885.00 DOWNSTREAM ELEVATION(FEET) = 1875.00 STREET LENGTH (FEET) = 288.50 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 84.85 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.62HALFSTREET FLOOD WIDTH (FEET) = 24.24 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.80 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.25STREET FLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 17.64 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.605 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" A 2.52 0.98 0.600 6.40 0.98 0.250 32 MOBILE HOME PARK A SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349

SUBAREA AREA (ACRES) = 8.92 SUBAREA RUNOFF (CFS) = 18.18 EFFECTIVE AREA(ACRES) = 48.28 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51TOTAL AREA (ACRES) = 48.3 PEAK FLOW RATE (CFS) = 91.65

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.91 FLOW VELOCITY (FEET/SEC.) = 6.97 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.45 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20226.00 = 2369.18 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20226.00 TO NODE 20227.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 5 USED) <<<<

\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1875.00 DOWNSTREAM ELEVATION(FEET) = 1863.00 STREET LENGTH (FEET) = 404.50 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0202ZZ.RES

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.87
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.17
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.42
 STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 19.42
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.459
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
 DEVELOPMENT TYPE/
                                     Fρ
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                     A 4.46 0.98 0.250
 MOBILE HOME PARK
 PUBLIC PARK
                      A
                              4.98
                                        0.98 0.850
                                                        32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.96 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.572
 SUBAREA AREA (ACRES) = 11.40 SUBAREA RUNOFF (CFS) = 19.51
 EFFECTIVE AREA(ACRES) = 72.38 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 72.4 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.66
 FLOW VELOCITY (FEET/SEC.) = 8.06 DEPTH*VELOCITY (FT*FT/SEC.) = 5.59
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 374.5 FT WITH ELEVATION-DROP = 15.0 FT, IS 41.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20228.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20228.00 = 3148.18 FEET.
******************
 FLOW PROCESS FROM NODE 20228.00 TO NODE 20229.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1848.00 DOWNSTREAM ELEVATION(FEET) = 1826.00
 STREET LENGTH (FEET) = 510.53 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 142.27
```

File name: LR0202ZZ.RES

Page 22

Date: 04/21/2014

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.33
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.99
 STREET FLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 20.42
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.386
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                         SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      A 5.30
                                       0.98 0.250 32
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.30
                                         0.98
                                                  0.600 32
 PUBLIC PARK
                       A
                                6.33
                                         0.98 0.850 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
 SUBAREA AREA(ACRES) = 15.93 SUBAREA RUNOFF(CFS) = 26.06
 EFFECTIVE AREA(ACRES) = 88.31 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 88.3 PEAK FLOW RATE (CFS) = 150.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.16
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.94
 FLOW VELOCITY (FEET/SEC.) = 8.61 DEPTH*VELOCITY (FT*FT/SEC.) = 6.19
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 510.5 FT WITH ELEVATION-DROP = 22.0 FT, IS 53.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20229.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20229.00 = 3658.71 FEET.
*****************
 FLOW PROCESS FROM NODE 20229.00 TO NODE 20230.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1826.00 DOWNSTREAM ELEVATION(FEET) = 1800.00
 STREET LENGTH (FEET) = 713.66 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 168.36
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.26
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.35
 STREET FLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 21.86
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.291
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                       SCS
 LAND USE
MOBILE HOME PARK
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                              0.250
                    A 11.14 0.98
                      A 6.85 0.98 0.850
 PUBLIC PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.99 0.98 0.600
                                                        32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.501
 SUBAREA AREA(ACRES) = 21.98
                              SUBAREA RUNOFF(CFS) = 35.67
 EFFECTIVE AREA(ACRES) = 110.29 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 110.3 PEAK FLOW RATE (CFS) = 178.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.99
 FLOW VELOCITY (FEET/SEC.) = 8.43 DEPTH*VELOCITY (FT*FT/SEC.) = 6.57
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.66
 PIPE-FLOW(CFS) = 39.80
 PIPEFLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 21.36
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.323
 SUBAREA AREA (ACRES) = 21.98 SUBAREA RUNOFF (CFS) = 36.29
 TOTAL AREA(ACRES) = 110.3
                                PEAK FLOW RATE (CFS) = 181.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 141.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.77
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20230.00 = 4372.37 FEET.
******************
 FLOW PROCESS FROM NODE 20230.00 TO NODE 20231.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
```

Date: 04/21/2014

UPSTREAM ELEVATION(FEET) = 1800.00 DOWNSTREAM ELEVATION(FEET) = 1769.00 STREET LENGTH (FEET) = 900.35 CURB HEIGHT (INCHES) = 6.0

Date: 04/21/2014 File name: LR0202ZZ.RES Page 23 File name: LR0202ZZ.RES Page 24

```
STREET HALFWIDTH (FEET) = 18.00
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 155.04
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    ***STREET FLOWING FULL***
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.75
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 30.59
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.97
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.99
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20231.00 = 5272.72 FEET.
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                 *******************
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   FLOW PROCESS FROM NODE 20231.00 TO NODE 20232.00 IS CODE = 63
  ***STREET FLOWING FULL***
                                                                                 ______
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 STREET FLOW DEPTH (FEET) = 0.82
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 HALFSTREET FLOOD WIDTH (FEET) = 34.25
                                                                                 _____
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.53
                                                                                  UPSTREAM ELEVATION(FEET) = 1769.00 DOWNSTREAM ELEVATION(FEET) = 1739.00
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.03
                                                                                  STREET LENGTH (FEET) = 905.39 CURB HEIGHT (INCHES) = 6.0
STREET FLOW TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 23.12
                                                                                  STREET HALFWIDTH (FEET) = 18.00
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.215
SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Ap SCS
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
MOBILE HOME PARK
                   A 14.01
                                        0.98
                                                 0.250 32
                             8.21
                                                 0.250 56
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
MOBILE HOME PARK
                     В
                                        0.75
RESIDENTIAL
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
"3-4 DWELLINGS/ACRE" A 2.69
                                        0.98
                                                 0.600
                                                        32
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
RESIDENTIAL
                   B 3.23 0.75 0.600 56
"3-4 DWELLINGS/ACRE"
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
SUBAREA AREA (ACRES) = 28.14 SUBAREA RUNOFF (CFS) = 48.92
                                                                                    ***STREET FLOWING FULL***
EFFECTIVE AREA(ACRES) = 138.43 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.47
TOTAL AREA(ACRES) = 138.4 PEAK FLOW RATE(CFS) = 219.99
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 35.10
FLOW VELOCITY (FEET/SEC.) = 8.67 DEPTH*VELOCITY (FT*FT/SEC.) = 7.30
                                                                                       LAND USE
                                                                                  MOBILE HOME PARK
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                  MOBILE HOME PARK
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                  RESIDENTIAL
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 14.28
PIPE-FLOW(CFS) = 70.16
PIPEFLOW TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 22.41
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.257
SUBAREA AREA (ACRES) = 28.14 SUBAREA RUNOFF (CFS) = 49.98
TOTAL AREA (ACRES) = 138.4 PEAK FLOW RATE (CFS) = 225.20
```

Page 25

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

File name: LR0202ZZ.RES

Date: 04/21/2014

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.87
 HALFSTREET FLOOD WIDTH (FEET) = 36.57
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.70
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.58
STREET FLOW TRAVEL TIME (MIN.) = 1.73 Tc (MIN.) = 24.15
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.158
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              qД
                                                        SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                     A
                             0.17 0.98 0.250
                                        0.75
                       В
                             5.75
                                                0.250
                                                        56
"3-4 DWELLINGS/ACRE" B 11.10 0.75
                                                0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.478
SUBAREA AREA(ACRES) = 17.02 SUBAREA RUNOFF(CFS) = 27.57
EFFECTIVE AREA (ACRES) = 155.45 AREA-AVERAGED Fm(INCH/HR) = 0.44
AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
TOTAL AREA (ACRES) = 155.4 PEAK FLOW RATE (CFS) = 240.47
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
      Date: 04/21/2014
                      File name: LR0202ZZ.RES
                                                      Page 26
```

238.99

```
DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.63
                                                                                         522.28 23.43 2.198 0.95(0.44) 0.46
                                                                                                                                322.6 20220.00
 FLOW VELOCITY (FEET/SEC.) = 8.72 DEPTH*VELOCITY (FT*FT/SEC.) = 7.61
                                                                                         519.47 24.01 2.166 0.95(0.44)0.46
                                                                                                                               326.7 20210.00
                                                                                         478.09 27.73 1.986 0.95(0.44) 0.47 337.2 20200.00
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
                                                                                COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                PEAK FLOW RATE (CFS) = 522.28 Tc (MIN.) = 23.43
                                                                                EFFECTIVE AREA(ACRES) = 322.61 AREA-AVERAGED Fm(INCH/HR) = 0.44
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.46
 ASSUME FULL-FLOWING PIPELINE
                                                                                TOTAL AREA (ACRES) = 337.2
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.93
                                                                                LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
 PIPE-FLOW(CFS) = 88.75
                                                                              *******************
 PIPEFLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 23.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.198
                                                                                FLOW PROCESS FROM NODE 20232.00 TO NODE 20249.00 IS CODE = 63
 SUBAREA AREA(ACRES) = 17.02 SUBAREA RUNOFF(CFS) = 28.18
                                                                              ______
 TOTAL AREA(ACRES) = 155.4 PEAK FLOW RATE(CFS) = 246.04
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               >>>> (STREET TABLE SECTION # 13 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              _____
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                UPSTREAM ELEVATION(FEET) = 1739.00 DOWNSTREAM ELEVATION(FEET) = 1735.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                STREET LENGTH (FEET) = 1274.82 CURB HEIGHT (INCHES) = 8.0
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 157.28
                                                                                STREET HALFWIDTH (FEET) = 32.00
   ***STREET FLOWING FULL***
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.76
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   HALFSTREET FLOOD WIDTH (FEET) = 31.01
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.99
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20232.00 = 6178.11 FEET.
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 534.73
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                  ***STREET FLOWING FULL***
______
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TOTAL NUMBER OF STREAMS = 2
                                                                                 STREET FLOW DEPTH(FEET) = 1.68
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 82.67
 TIME OF CONCENTRATION (MIN.) = 23.43
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.16
 RAINFALL INTENSITY (INCH/HR) = 2.20
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.98
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 5.11 Tc (MIN.) = 28.54
 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.94
                                                                                * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.952
 AREA-AVERAGED Ap = 0.47
                                                                                SUBAREA LOSS RATE DATA(AMC II):
 EFFECTIVE STREAM AREA(ACRES) = 155.45
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TOTAL STREAM AREA(ACRES) = 155.45
                                                                                  LAND USE
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 246.04
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 0.11
                                                                                                                      0.98
                                                                                                                              0.600
                                                                                                                                      32
 ** CONFLUENCE DATA **
                                                                                RESIDENTIAL
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                "3-4 DWELLINGS/ACRE" B 18.30 0.75 0.600 56
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
          277.91 24.01 2.166 0.96(0.44) 0.46 171.3 20210.00
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
    1
                                                                                SUBAREA AREA (ACRES) = 18.41 SUBAREA RUNOFF (CFS) = 24.90
    1
          261.64 27.73 1.986 0.96(0.45) 0.46 181.7 20200.00
          246.04 23.43 2.198 0.94(0.44) 0.47 155.4 20220.00
                                                                                EFFECTIVE AREA(ACRES) = 341.02 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                TOTAL AREA (ACRES) = 355.6 PEAK FLOW RATE (CFS) = 522.28
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 ** PEAK FLOW RATE TABLE **
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                      HEADWATER
                                                                                5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.00
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
```

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 28

Page 27

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.67 HALFSTREET FLOOD WIDTH(FEET) = 81.94
 FLOW VELOCITY (FEET/SEC.) = 4.14 DEPTH*VELOCITY (FT*FT/SEC.) = 6.89
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 96.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.37
 PIPE-FLOW(CFS) = 471.17
 PIPEFLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 25.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.079
 SUBAREA AREA(ACRES) = 18.41
                            SUBAREA RUNOFF (CFS) = 27.00
 TOTAL AREA (ACRES) = 355.6 PEAK FLOW RATE (CFS) = 522.28
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 51.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.82
   HALFSTREET FLOOD WIDTH (FEET) = 39.71
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.18
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.79
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.
******************
 FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.69
 RAINFALL INTENSITY (INCH/HR) = 2.08
 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 341.02
 TOTAL STREAM AREA(ACRES) = 355.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 522.28
******************
 FLOW PROCESS FROM NODE 20240.00 TO NODE 20241.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 916.98
 ELEVATION DATA: UPSTREAM(FEET) = 1880.00 DOWNSTREAM(FEET) = 1855.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.964
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.134
       Date: 04/21/2014
```

File name: LR020277.RFS

Page 29

```
SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                      SCS
                                                Αp
                                                         Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.79
                                       0.98
                                             0.600
                                                       32 12.96
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.77 0.75 0.600
                                                      56 12.96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 20.10
 TOTAL AREA (ACRES) =
                   8.56 PEAK FLOW RATE(CFS) =
                                                  20.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
********************
 FLOW PROCESS FROM NODE 20241.00 TO NODE 20242.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1855.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1848.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 207.39
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.055
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.59
                                       0.98
                                               0.600
                                                       32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             2.06 0.75 0.600
                                                       56
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.06
 AVERAGE FLOW DEPTH(FEET) = 0.56 FLOOD WIDTH(FEET) = 28.17
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 13.53
 SUBAREA AREA(ACRES) = 3.65 SUBAREA RUNOFF(CFS) = 8.36
 EFFECTIVE AREA(ACRES) = 12.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 12.2
                               PEAK FLOW RATE(CFS) =
                                                        27.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.58 FLOOD WIDTH(FEET) = 30.41
 FLOW VELOCITY (FEET/SEC.) = 6.10 DEPTH*VELOCITY (FT*FT/SEC) = 3.56
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20242.00 = 1124.37 FEET.
FLOW PROCESS FROM NODE 20242.00 TO NODE 20243.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
```

Date: 04/21/2014 File name: LR020277.RFS Page 30

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
 UPSTREAM NODE ELEVATION (FEET) = 1848.00
                                                                                   STREET FLOW DEPTH (FEET) = 0.58
 DOWNSTREAM NODE ELEVATION (FEET) = 1840.00
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 21.05
 CHANNEL LENGTH THRU SUBAREA (FEET) = 276.91
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.44
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 15.21
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.848
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.953
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                        SCS
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                     LAND USE
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                       SCS
                                                                                 RESIDENTIAL
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                                                        32
                                                                                                      A 3.29
                                                                                                                         0.98
                                                                                                                                0.600
 RESIDENTIAL
                                                                                 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                                 0.600
                                                        32
                                                                                 "3-4 DWELLINGS/ACRE" B 4.18
                    A
                                2.48
                                         0.98
                                                                                                                         0.75
                                                                                                                                0.600
                                                                                                                                         56
 RESIDENTIAL
                                                                                 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                              3.59
                                         0.75
                                                 0.600
                                                                                 ".4 DWELLING/ACRE"
                                                                                                      B 1.12 0.75 0.900
                                                                                                                                        56
                      В
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
                      в 0.59
                                        0.75 0.900
 ".4 DWELLING/ACRE"
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.639
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
                                                                                 SUBAREA AREA(ACRES) = 8.59 SUBAREA RUNOFF(CFS) = 17.92
                                                                                 EFFECTIVE AREA(ACRES) = 27.46 AREA-AVERAGED Fm(INCH/HR) = 0.52
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.14
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.62
                                                                                 TOTAL AREA(ACRES) = 27.5 PEAK FLOW RATE(CFS) = 57.45
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.91
 AVERAGE FLOW DEPTH (FEET) = 0.62 FLOOD WIDTH (FEET) = 35.34
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 14.31
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 6.66 SUBAREA RUNOFF(CFS) = 14.59
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 EFFECTIVE AREA(ACRES) = 18.87 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.61
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 18.9
                              PEAK FLOW RATE(CFS) =
                                                          41.33
                                                                                 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.16
                                                                                 FLOW VELOCITY (FEET/SEC.) = 5.63 DEPTH*VELOCITY (FT*FT/SEC.) = 3.39
                                                                                 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20244.00 = 1694.78 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                                FLOW PROCESS FROM NODE 20244.00 TO NODE 20245.00 IS CODE = 63
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.65 FLOOD WIDTH (FEET) = 38.17
 FLOW VELOCITY (FEET/SEC.) = 6.05 DEPTH*VELOCITY (FT*FT/SEC) = 3.93
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20243.00 = 1401.28 FEET.
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                               _____
******************
                                                                                 UPSTREAM ELEVATION(FEET) = 1830.00 DOWNSTREAM ELEVATION(FEET) = 1815.00
                                                                                 STREET LENGTH (FEET) = 273.00 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 20243.00 TO NODE 20244.00 IS CODE = 63
______
                                                                                 STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
_____
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1830.00
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 293.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   65.28
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.58
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 21.22
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.95
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.05
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 15.87
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 31 Date: 04/21/2014 File name: LR0202ZZ.RES Page 32

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.776 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	"3-4 DWELLINGS/ACRE" A 3.90 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 5.36 0.75 0.600 56 RESIDENTIAL
RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 2.55 0.98 0.600 32 RESIDENTIAL	".4 DWELLING/ACRE" B 0.93 0.75 0.900 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627
"3-4 DWELLINGS/ACRE" B 4.04 0.75 0.600 56 RESIDENTIAL	SUBAREA AREA(ACRES) = 10.19 SUBAREA RUNOFF(CFS) = 19.72 EFFECTIVE AREA(ACRES) = 45.39 AREA-AVERAGED Fm(INCH/HR) = 0.52
".4 DWELLING/ACRE" B 1.15 0.75 0.900 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645	AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.63  TOTAL AREA(ACRES) = 45.4 PEAK FLOW RATE(CFS) = 87.76
SUBAREA AREA (ACRES) = 7.74 SUBAREA RUNOFF(CFS) = 15.67 EFFECTIVE AREA (ACRES) = 35.20 AREA-AVERAGED FM (INCH/HR) = 0.52 AREA-AVERAGED FP (INCH/HR) = 0.84 AREA-AVERAGED AP = 0.62	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.81
TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) = 71.36  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):	END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.70
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50	LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20246.00 = 2326.78 FEET.
END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.60	**************************************
LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20245.00 = 1967.78 FEET.	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 18 USED) <>>>>
**************************************	UPSTREAM ELEVATION(FEET) = 1805.00 DOWNSTREAM ELEVATION(FEET) = 1795.00  STREET LENGTH(FEET) = 324.04 CURB HEIGHT(INCHES) = 8.0
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 18 USED) <>>>>	STREET HALFWIDTH (FEET) = 26.00
UPSTREAM ELEVATION(FEET) = 1815.00 DOWNSTREAM ELEVATION(FEET) = 1805.00  STREET LENGTH(FEET) = 359.00 CURB HEIGHT(INCHES) = 8.0  STREET HALFWIDTH(FEET) = 26.00	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 95.67
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.85	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.70
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.22 ***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	HALFSTREET FLOOD WIDTH (FEET) = 27.83  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.27  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.41  STREET FLOW TRAVEL TIME (MIN.) = 0.86 TG (MIN.) = 17.78
STREET FLOW DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.91	STREET FLOW TRAVEL TIME(MIN.) = 0.86 Tc(MIN.) = 17.78 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.593 SUBAREA LOSS RATE DATA(AMC II):
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.69  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.90  STREET FLOW TRAVEL TIME(MIN.) = 1.05 Tc(MIN.) = 16.92	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.672 SUBAREA LOSS RATE DATA(AMC II):	"3-4 DWELLINGS/ACRE" A 3.02 0.98 0.600 32 RESIDENTIAL
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	"3-4 DWELLINGS/ACRE" B 4.88 0.75 0.600 56  RESIDENTIAL  ".4 DWELLING/ACRE" B 0.55 0.75 0.900 56
RESIDENTIAL  Poto: 04/31/3014 File name: LP030377 DES	".4 DWELLING/ACRE" B 0.55 0.75 0.900 56

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 34

Date: 04/21/2014

File name: LR0202ZZ.RES

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA(ACRES) = 8.45 SUBAREA RUNOFF(CFS) = 15.83
 EFFECTIVE AREA(ACRES) = 53.84 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 53.8 PEAK FLOW RATE (CFS) =
                                                        100.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.26
 FLOW VELOCITY (FEET/SEC.) = 6.38 DEPTH*VELOCITY (FT*FT/SEC.) = 4.54
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20247.00 = 2650.82 FEET.
*****************
 FLOW PROCESS FROM NODE 20247.00 TO NODE 20248.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1795.00 DOWNSTREAM ELEVATION(FEET) = 1782.00
 STREET LENGTH (FEET) = 263.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 107.22
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.85
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.55
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.16
 STREET FLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 18.36
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.544
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  Αp
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.94
                                          0.98
                                                  0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.00
                                          0.75
                                                  0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.49
                                          0.75
                                                0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA (ACRES) = 7.43 SUBAREA RUNOFF (CFS) = 13.67
 EFFECTIVE AREA(ACRES) = 61.27 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.62
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.16
 FLOW VELOCITY (FEET/SEC.) = 7.69 DEPTH*VELOCITY (FT*FT/SEC.) = 5.30
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20248.00 = 2913.82 FEET.
******************
 FLOW PROCESS FROM NODE 20248.00 TO NODE 20249.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1782.00 DOWNSTREAM ELEVATION(FEET) = 1735.00
 STREET LENGTH (FEET) = 1589.51 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 30.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.25
 STREET FLOW TRAVEL TIME (MIN.) = 3.86 Tc (MIN.) = 22.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.268
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Aр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.28
                                          0.98
                                                  0.600
                                                          32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 21.09
                                          0.75
                                                  0.600
                                                          56
 RESIDENTIAL.
                              0.85
 ".4 DWELLING/ACRE"
                       В
                                         0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.611
 SUBAREA AREA (ACRES) = 22.22 SUBAREA RUNOFF (CFS) = 36.18
 EFFECTIVE AREA(ACRES) = 83.49 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 83.5 PEAK FLOW RATE (CFS) = 132.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
```

File name: LR0202ZZ.RES

Page 36

Date: 04/21/2014

TOTAL AREA (ACRES) = 61.3 PEAK FLOW RATE (CFS) = 111.66

```
END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.19
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 FLOW VELOCITY (FEET/SEC.) = 6.90 DEPTH*VELOCITY (FT*FT/SEC.) = 5.31
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20249.00 = 4503.33 FEET.
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
______
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 641.38
 TOTAL NUMBER OF STREAMS = 2
                                                                                  ***STREET FLOWING FULL***
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TIME OF CONCENTRATION (MIN.) = 22.22
                                                                                 STREET FLOW DEPTH (FEET) = 1.64
 RAINFALL INTENSITY (INCH/HR) = 2.27
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 80.84
 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.23
 AREA-AVERAGED Fp (INCH/HR) = 0.81
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.59
 AREA-AVERAGED Ap = 0.62
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 26.94
 EFFECTIVE STREAM AREA(ACRES) = 83.49
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.021
 TOTAL STREAM AREA(ACRES) = 83.49
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 132.65
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fρ
                                                                                    LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ** CONFLUENCE DATA **
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 0.58 0.75 0.600
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                RESIDENTIAL
          522.28 25.69 2.079 0.94(0.44) 0.47 341.0 20220.00
    1
                                                                                ".4 DWELLING/ACRE" B 0.42 0.75 0.900 56
          519.47 26.27 2.052 0.94(0.44) 0.47
                                               345.2 20210.00
    1
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
          478.09 30.05 1.893 0.94(0.44) 0.47
                                               355.6 20200.00
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.726
          132.65 22.22 2.268 0.81(0.50)0.62
                                               83.5 20240.00
                                                                                SUBAREA AREA (ACRES) = 1.00 SUBAREA RUNOFF (CFS) = 1.33
                                                                                EFFECTIVE AREA(ACRES) = 425.51 AREA-AVERAGED Fm(INCH/HR) = 0.45
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.50
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                TOTAL AREA(ACRES) = 440.1
                                                                                                               PEAK FLOW RATE (CFS) = 640.72
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 ** PEAK FLOW RATE TABLE **
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  STREAM
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
    1
          636.58 22.22 2.268 0.90(0.46) 0.50 378.5 20240.00
    2
          640.72 25.69 2.079 0.91(0.45) 0.50 424.5 20220.00
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
          635.83 26.27 2.052 0.91(0.45) 0.50 428.6 20210.00
                                                                                DEPTH(FEET) = 1.64 HALFSTREET FLOOD WIDTH(FEET) = 80.84
          582.53 30.05 1.893 0.91(0.45) 0.50
                                               439.1 20200.00
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.22 DEPTH*VELOCITY (FT*FT/SEC.) = 8.58
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 PEAK FLOW RATE (CFS) = 640.72 Tc (MIN.) = 25.69
                                                                                      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 EFFECTIVE AREA(ACRES) = 424.51 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.50
                                                                                ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 TOTAL AREA (ACRES) = 439.1
                                                                                ESTIMATED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.
                                                                                ASSUME FULL-FLOWING PIPELINE
                                                                                PIPE-FLOW VELOCITY (FEET/SEC.) = 11.44
PIPE-FLOW(CFS) = 506.01
 FLOW PROCESS FROM NODE 20249.00 TO NODE 20250.00 IS CODE = 63
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 26.26
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.052
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                SUBAREA AREA (ACRES) = 1.00 SUBAREA RUNOFF (CFS) = 1.36
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                TOTAL AREA (ACRES) = 440.1 PEAK FLOW RATE (CFS) = 640.72
______
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UPSTREAM ELEVATION(FEET) = 1735.00 DOWNSTREAM ELEVATION(FEET) = 1733.00
 STREET LENGTH (FEET) = 391.69 CURB HEIGHT (INCHES) = 8.0
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HALFWIDTH (FEET) = 32.00
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
```

SCS

56

Date: 04/21/2014 Page 37 Date: 04/21/2014 File name: LR0202ZZ.RES File name: LR020277.RFS Page 38

```
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 134.70
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 1.00
  HALFSTREET FLOOD WIDTH (FEET) = 48.43
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.46
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.45
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20250.00 = 9100.48 FEET.
*************************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
************************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20151.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1868.80 Tc (MIN.) = 36.12
 AREA-AVERAGED Fm (INCH/HR) = 0.61 Ybar = 0.53
 TOTAL AREA(ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1868.80 Tc (MIN.) = 36.12
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.53
 TOTAL AREA(ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
********************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
FLOW PROCESS FROM NODE 20151.00 TO NODE 20250.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1785.00 DOWNSTREAM(FEET) = 1733.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1656.68 CHANNEL SLOPE = 0.0314
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1868.80
 FLOW VELOCITY (FEET/SEC.) = 30.94 FLOW DEPTH (FEET) = 3.54
 TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 37.01
```

```
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
******************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 MAINLINE Tc(MIN.) = 37.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.670
 SUBAREA LOSS RATE DATA (AMC II):
                     SCS SOIL AREA
  DEVELOPMENT TYPE/
                                     Fp
                                               Ар
                                                        SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        B 1.58
                                         0.75
                                                 0.600
                                                         56
 RESIDENTIAL
                               54.48
 ".4 DWELLING/ACRE"
                       В
                                         0.75
                                                 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892
 SUBAREA AREA(ACRES) = 56.06
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.18;6H= 3.09;24H= 7.48
 S-GRAPH: VALLEY (DEV.) = 23.5%; VALLEY (UNDEV.) / DESERT= 76.5%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.49; Fm(INCH/HR) = 0.61; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1781.1
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0422; Lca/L=0.4, n=.0379; Lca/L=0.5, n=.0348; Lca/L=0.6, n=.0325
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 543.57
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1686.22
 TOTAL AREA (ACRES) = 1781.1 PEAK FLOW RATE (CFS) = 1868.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.71
***********************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 2050.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1868.80 Tc (MIN.) = 37.01
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.54
 TOTAL AREA (ACRES) =
                    1781.1
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
          0
                 Tc Intensity Fp(Fm)
                                                Аe
                                                        HEADWATER
            (CFS) (MIN.) (INCH/HR) (INCH/HR)
  NUMBER
                                                (ACRES) NODE
           636.58 22.80 2.234 0.90(0.46) 0.51
                                                379.5 20240.00
           640.72 26.26 2.052 0.91(0.45)0.50
                                                  425.5 20220.00
           635.83 26.84 2.025 0.91(0.45)0.50
                                                  429.6 20210.00
           582.53 30.62
                        1.872 0.91(0.45)0.50
                                                  440.1 20200.00
       Date: 04/21/2014 File name: LR0202ZZ.RES
                                                       Page 40
```

```
LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 2050.00 = 9100.48 FEET.
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                                                                             SUBAREA AREA(ACRES) = 38.60
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             UNIT-HYDROGRAPH DATA:
 UNIT-HYDROGRAPH DATA:
                                                                             RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.14;6H= 3.01;24H= 7.34
 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.14;6H= 3.02;24H= 7.36
                                                                             S-GRAPH: VALLEY(DEV.) = 39.0%; VALLEY(UNDEV.) / DESERT = 61.0%
 S-GRAPH: VALLEY (DEV.) = 38.4%; VALLEY (UNDEV.) / DESERT= 61.6%
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.58; Ybar = 0.52
 Tc(HR) = 0.62; LAG(HR) = 0.49; Fm(INCH/HR) = 0.58; Ybar = 0.52
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
                                                                             3HR = 0.98; 6HR = 0.99; 24HR = 1.00
                                                                             UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2259.8
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2221.2
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
                                                                             EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                             Lca/L=0.3, n=.0390; Lca/L=0.4, n=.0349; Lca/L=0.5, n=.0321; Lca/L=0.6, n=.0299
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0422; Lca/L=0.4,n=.0379; Lca/L=0.5,n=.0348; Lca/L=0.6,n=.0325
                                                                             TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 693.41
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 682.40
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2093.39
 PEAK FLOW RATE(CFS) = 2112.24
                                                                             TOTAL AREA (ACRES) = 2259.8 PEAK FLOW RATE (CFS) = 2112.24
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
******************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 12
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                           _____
                                                                             FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
******************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20274.00 IS CODE = 54
                                                                             >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
._____
                                                                           ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             TOTAL NUMBER OF STREAMS = 2
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                             CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
PEAK FLOW RATE (CFS) = 2112.24 Tc (MIN.) = 38.33
                                                                             AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.52
 ELEVATION DATA: UPSTREAM(FEET) = 1733.00 DOWNSTREAM(FEET) = 1670.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2379.03 CHANNEL SLOPE = 0.0265
                                                                             TOTAL AREA (ACRES) = 2259.8
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
                                                                           ******************
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 2112.24
                                                                             FLOW PROCESS FROM NODE 20260.00 TO NODE 20261.00 IS CODE = 21
 FLOW VELOCITY (FEET/SEC.) = 30.07 FLOW DEPTH (FEET) = 3.93
                                                                            ______
 TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 38.33
                                                                             >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
                                                                             >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                           _____
*********************
                                                                             INITIAL SUBAREA FLOW-LENGTH (FEET) = 680.83
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 81
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2360.00
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
_____
                                                                             SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.333
 MAINLINE Tc(MIN.) = 38.33
                                                                             * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.412
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.636
                                                                             SUBAREA To AND LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fр
                                                                                                                          Αp
                                                                                                                                SCS Tc
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Ар
                                                    SCS
                                                                                LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                             NATURAL FAIR COVER
 RESIDENTIAL
                                                                             "OPEN BRUSH"
                                                                                                          4.43
                                                                                                                  0.61
                                                                                                                        1.000
                                                                                                                                 66 11.82
 "3-4 DWELLINGS/ACRE"
                      В
                              3.23
                                       0.75
                                              0.600
                                                   56
                                                                             RESIDENTIAL
                                                                                                B 2.14 0.75 0.700
 RESIDENTIAL
                                                                             "2 DWELLINGS/ACRE"
                                                                                                                                 56 7.33
 "3-4 DWELLINGS/ACRE"
                              0.07
                                       0.98
                                              0.600
                                                    32
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       В
                              9.49
                                      0.75
                                              0.900
                                                    56
                                                                             SUBAREA RUNOFF (CFS) = 22.63
                       В
                              24.91
                                      0.75
                                              0.600
                                                     56
                                                                             TOTAL AREA (ACRES) = 6.57 PEAK FLOW RATE (CFS) =
 SCHOOL
 SCHOOL
                       Α
                              0.90
                                       0.98
                                              0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 42

Date: 04/21/2014

File name: LR020277.RFS

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
******************
                                                                        _____
 FLOW PROCESS FROM NODE 20261.00 TO NODE 20262.00 IS CODE = 54
                                                                          MAINLINE Tc(MIN.) = 13.40
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.073
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                                                             Fρ
                                                                                                                     Дp
______
                                                                             LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2360.00 DOWNSTREAM(FEET) = 2280.00
                                                                          RESIDENTIAL
                                                                                                     8.82 0.75 0.700
 CHANNEL LENGTH THRU SUBAREA (FEET) = 583.76 CHANNEL SLOPE = 0.1370
                                                                          "2 DWELLINGS/ACRE"
                                                                                             В
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              22.63
                                                                          SUBAREA AREA (ACRES) = 8.82
                                                                                                     SUBAREA RUNOFF (CFS) = 20.23
 FLOW VELOCITY (FEET/SEC.) = 3.78 FLOW DEPTH (FEET) = 0.35
                                                                          EFFECTIVE AREA(ACRES) = 35.73 AREA-AVERAGED Fm(INCH/HR) = 0.58
 TRAVEL TIME (MIN.) = 2.58 Tc (MIN.) = 9.91
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20262.00 = 1264.59 FEET.
                                                                          TOTAL AREA (ACRES) = 35.7
                                                                                                      PEAK FLOW RATE(CFS) =
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 FLOW PROCESS FROM NODE 20262.00 TO NODE 20262.00 IS CODE = 81
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
______
                                                                         *******************
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                          FLOW PROCESS FROM NODE 20263.00 TO NODE 20264.00 IS CODE = 54
 MAINLINE Tc(MIN.) = 9.91
                                                                         ______
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.683
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                            Ар
                                                  SCS
                                                                        ______
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2110.00
 RESIDENTIAL
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 784.49 CHANNEL SLOPE = 0.0765
 "2 DWELLINGS/ACRE"
                                            0.700
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                    В
                           4.44
                                     0.75
                                                 56
 NATURAL FAIR COVER
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                            15.90
 "OPEN BRUSH"
                      В
                                     0.61
                                           1.000
                                                                          CHANNEL FLOW THRU SUBAREA(CFS) = 80.32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
                                                                          FLOW VELOCITY (FEET/SEC.) = 4.17 FLOW DEPTH (FEET) = 0.62
                                                                          TRAVEL TIME (MIN.) = 3.14 Tc (MIN.) = 16.54
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.935
 SUBAREA AREA (ACRES) = 20.34
                            SUBAREA RUNOFF (CFS) = 56.54
                                                                          LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20264.00 = 3043.45 FEET.
 EFFECTIVE AREA(ACRES) = 26.91 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                        ******************
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.93
 TOTAL AREA(ACRES) = 26.9
                            PEAK FLOW RATE(CFS) =
                                                                          FLOW PROCESS FROM NODE 20264.00 TO NODE 20264.00 IS CODE = 81
                                                   74.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                        _____
                                                                         MAINLINE Tc(MIN.) = 16.54
******************
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.708
 FLOW PROCESS FROM NODE 20262.00 TO NODE 20263.00 IS CODE = 54
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                          DEVELOPMENT TYPE/
                                                                                            SCS SOIL AREA
                                                                                                             Fр
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          RESIDENTIAL
______
                                                                          "2 DWELLINGS/ACRE"
                                                                                              В 17.48
                                                                                                             0.75
                                                                                                                     0.700
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2170.00
                                                                          NATURAL FAIR COVER
 CHANNEL LENGTH THRU SUBAREA (FEET) = 994.37 CHANNEL SLOPE = 0.1106
                                                                          "OPEN BRUSH"
                                                                                               В
                                                                                                    7.48
                                                                                                             0.61 1.000
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.790
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             74.86
                                                                          SUBAREA AREA(ACRES) = 24.96
                                                                                                     SUBAREA RUNOFF (CFS) = 48.47
 FLOW VELOCITY (FEET/SEC.) = 4.75 FLOW DEPTH (FEET) = 0.56
                                                                          EFFECTIVE AREA(ACRES) = 60.69 AREA-AVERAGED Fm(INCH/HR) = 0.57
 TRAVEL TIME (MIN.) = 3.49 Tc (MIN.) = 13.40
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20263.00 = 2258.96 FEET.
                                                                          TOTAL AREA (ACRES) = 60.7 PEAK FLOW RATE (CFS) =
*******************
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 FLOW PROCESS FROM NODE 20263.00 TO NODE 20263.00 IS CODE = 81
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
```

Page 43

Date: 04/21/2014

File name: LR020277.RFS

Date: 04/21/2014 File name: LR020277.RFS Page 44

SCS

80.32

56

117.07

\* FLOW PROCESS FROM NODE 20264.00 TO NODE 20265.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2080.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.96 CHANNEL SLOPE = 0.0454 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00 CHANNEL FLOW THRU SUBAREA(CFS) = 117.07 FLOW VELOCITY (FEET/SEC.) = 3.76 FLOW DEPTH (FEET) = 0.79 TRAVEL TIME (MIN.) = 2.93 Tc (MIN.) = 19.46LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20265.00 = 3704.41 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20265.00 TO NODE 20265.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc (MIN.) = 19.46\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.456 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "2 DWELLINGS/ACRE" 6.85 0.75 0.700 56 RESIDENTIAL ".4 DWELLING/ACRE" в 0.71 0.75 0.900 NATURAL FAIR COVER "OPEN BRUSH" В 59.45 0.61 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968 SUBAREA AREA(ACRES) = 67.01 SUBAREA RUNOFF(CFS) = 111.62 EFFECTIVE AREA(ACRES) = 127.70 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.91 TOTAL AREA (ACRES) = 127.7 PEAK FLOW RATE (CFS) = 214.91 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50 \* FLOW PROCESS FROM NODE 20265.00 TO NODE 20266.00 IS CODE = 54 ..... >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2010.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 947.22 CHANNEL SLOPE = 0.0739 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00 CHANNEL FLOW THRU SUBAREA(CFS) = 214.91 FLOW VELOCITY (FEET/SEC.) = 5.27 FLOW DEPTH (FEET) = 0.90 TRAVEL TIME (MIN.) = 3.00 Tc (MIN.) = 22.46

FLOW PROCESS FROM NODE 20266.00 TO NODE 20266.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc (MIN.) = 22.46\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.254 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "2 DWELLINGS/ACRE" В 10.89 0.75 0.700 56 RESIDENTIAL ".4 DWELLING/ACRE" В 11.99 0.75 0.900 NATURAL FAIR COVER "OPEN BRUSH" В 4.30 0.61 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836 SUBAREA AREA(ACRES) = 27.18 SUBAREA RUNOFF (CFS) = 40.36EFFECTIVE AREA(ACRES) = 154.88 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.89 TOTAL AREA(ACRES) = 154.9 PEAK FLOW RATE(CFS) = 232.04 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20266.00 TO NODE 20267.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 2010.00 DOWNSTREAM(FEET) = 1960.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 906.98 CHANNEL SLOPE = 0.0551 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00 CHANNEL FLOW THRU SUBAREA(CFS) = 232.04 FLOW VELOCITY (FEET/SEC.) = 4.82 FLOW DEPTH (FEET) = 0.98 TRAVEL TIME (MIN.) = 3.14 Tc (MIN.) = 25.60LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20267.00 = 5558.61 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20267.00 TO NODE 20267.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc(MIN.) = 25.60\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.084 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Aр GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" В 53.81 0.75 0.700 56 RESIDENTIAL ".4 DWELLING/ACRE" В 46.51 0.75 0.900 56 NATURAL FAIR COVER 68.77 0.61 1.000 "OPEN BRUSH" SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.877

LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20266.00 = 4651.63 FEET.

Date: 04/21/2014

```
SUBAREA AREA(ACRES) = 169.09
                            SUBAREA RUNOFF(CFS) = 225.60
 EFFECTIVE AREA(ACRES) = 323.97 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) = 324.0 PEAK FLOW RATE (CFS) = 433.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
********************
 FLOW PROCESS FROM NODE 20267.00 TO NODE 20268.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1268.00 CHANNEL SLOPE = 0.0552
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 433.93
 FLOW VELOCITY (FEET/SEC.) = 11.43 FLOW DEPTH (FEET) = 2.52
 TRAVEL TIME (MIN.) = 1.85 Tc (MIN.) = 27.45
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20268.00 = 6826.61 FEET.
******************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20268.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 27.45
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.999
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fp
                                           Ар
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    в 30.11 0.75
                                           0.900
                                                  56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 0.46
                                   0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA AREA (ACRES) = 30.57 SUBAREA RUNOFF (CFS) = 36.53
 EFFECTIVE AREA(ACRES) = 354.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.89
 TOTAL AREA(ACRES) = 354.5 PEAK FLOW RATE(CFS) = 445.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20269.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1870.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 379.58 CHANNEL SLOPE = 0.0527
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

```
FLOW VELOCITY (FEET/SEC.) = 11.33 FLOW DEPTH (FEET) = 2.59
 TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 28.00
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20269.00 = 7206.19 FEET.
******************
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20269.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 28.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.975
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                 Fp
                                          Aр
                                                  SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 17.99
                                     0.75
                                            0.900
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           0.04
                                    0.75
                                            0.600
                                                   56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 18.04
                                    0.61 1.000
                                                   66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 16.31 0.75 0.700
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872
 SUBAREA AREA(ACRES) = 52.38
                           SUBAREA RUNOFF (CFS) = 64.51
 EFFECTIVE AREA(ACRES) = 406.92 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 406.9 PEAK FLOW RATE(CFS) =
                                                  502.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
******************
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20270.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1770.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2346.89 CHANNEL SLOPE = 0.0426
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 502.42
 FLOW VELOCITY (FEET/SEC.) = 10.84 FLOW DEPTH (FEET) = 2.92
 TRAVEL TIME (MIN.) = 3.61 Tc (MIN.) = 31.61
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20270.00 = 9553.08 FEET.
******************
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20270.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 31.61
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.836
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 47

Date: 04/21/2014 File name: LR0202ZZ.RES

	В	5.45	0.75	0.600	56	"OPEN BRUSH" B 0.17 0.61 1.000 66
RESIDENTIAL	_	E1 00	0 85	0 000	F.C.	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
".4 DWELLING/ACRE"	В	71.00	0.75	0.900	56	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856
NATURAL FAIR COVER	-	F 00	0 61	1 000	6.6	SUBAREA AREA (ACRES) = 156.71 SUBAREA RUNOFF (CFS) = 162.65
"OPEN BRUSH"	В	5.28	0.61	1.000	66	EFFECTIVE AREA (ACRES) = 685.70 AREA-AVERAGED Fm (INCH/HR) = 0.61
RESIDENTIAL	_	40.04	0 85	0 500	F. C	AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.87
"2 DWELLINGS/ACRE"			0.75	0.700	56	TOTAL AREA (ACRES) = 685.7 PEAK FLOW RATE (CFS) = 728.45
SUBAREA AVERAGE PERVIO				. /4		
SUBAREA AVERAGE PERVIO				104	T.C.	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
SUBAREA AREA (ACRES) =			RUNOFF (CFS			5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.40; 6HR = 1.91; 24HR = 4.34
EFFECTIVE AREA (ACRES)					= 0.60	
AREA-AVERAGED Fp (INCH/			-		E06 0E	END OF SUBAREA STREET FLOW HYDRAULICS:
TOTAL AREA (ACRES) =	529.0	PEAK F	LOW RATE (C	CFS) =	586.25	DEPTH(FEET) = 1.34 HALFSTREET FLOOD WIDTH(FEET) = 65.77
						FLOW VELOCITY(FEET/SEC.) = 9.28 DEPTH*VELOCITY(FT*FT/SEC.) = 12.46
SUBAREA AREA-AVERAGED						
5M = 0.31; 30M = 0.64;	1HR = 0.85	5; 3HR = 1.	39; 6HR =	1.90; 24H	4R = 4.17	*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
						THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
******						SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
FLOW PROCESS FROM NODE						** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
						ESTIMATED PIPE DIAMETER(INCH) = 72.00 NUMBER OF PIPES = 1
>>>>COMPUTE STREET FLO	OW TRAVEL I	TIME THRU S	UBAREA<<<	<<		ASSUME FULL-FLOWING PIPELINE
>>>> (STREET TABLE SEC	TION # 13 U	JSED) <<<<<				PIPE-FLOW VELOCITY(FEET/SEC.) = 20.31
	========				========	PIPE-FLOW(CFS) = 574.63
UPSTREAM ELEVATION (FEE'	T) = 1770.0	00 DOWNSTR	EAM ELEVAT	TION (FEET)	= 1755.00	PIPEFLOW TRAVEL TIME(MIN.) = 0.57 Tc(MIN.) = 32.18
STREET LENGTH (FEET) =	692.85	CURB HEIGH	T(INCHES)	= 8.0		* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.816
STREET HALFWIDTH (FEET)	= 32.00					SUBAREA AREA(ACRES) = 156.71 SUBAREA RUNOFF(CFS) = 165.95
						TOTAL AREA(ACRES) = 685.7 PEAK FLOW RATE(CFS) = 742.90
DISTANCE FROM CROWN TO	CROSSFALL	GRADEBREAK	(FEET) =	20.00		
INSIDE STREET CROSSFAL	L(DECIMAL)	= 0.020				SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
OUTSIDE STREET CROSSFA	LL (DECIMAL)	= 0.020	ı			5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.40; 6HR = 1.91; 24HR = 4.34
						STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
SPECIFIED NUMBER OF HA	LFSTREETS C	CARRYING RU	NOFF = 2			STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 168.27
STREET PARKWAY CROSSFA						***STREET FLOWING FULL***
Manning's FRICTION FAC	,			o-to-curb)	= 0.0180	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
Manning's FRICTION FAC						STREET FLOW DEPTH(FEET) = 0.87
MAXIMUM ALLOWABLE STRE						HALFSTREET FLOOD WIDTH(FEET) = 42.09
		111 (1221)	0.07			AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.14
**TRAVEL TIME COMPUT	ED USING ES	STIMATED FI	OW(CFS) =	667.5	58	PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.34
***STREET FLOWING FU		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.011 (02.0)	007.	, 0	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
STREETFLOW MODEL RES		ESTIMATED	FI.OW•			AND L = $692.8$ FT WITH ELEVATION-DROP = $15.0$ FT, IS $369.7$ CFS,
STREET FLOW DEPTH(FE			I LOW.			WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20271.00
HALFSTREET FLOOD WID	*					LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
AVERAGE FLOW VELOCIT			7			BONGEST FROM NODE 20200.00 TO NODE 20271.00 - 10243.33 FEBT.
PRODUCT OF DEPTH&VEL		*				***************************************
STREET FLOW TRAVEL TIM				22 00		FLOW PROCESS FROM NODE 20270.00 TO NODE 20271.00 IS CODE = 71
				32.09		FLOW PROCESS FROM NODE 202/0.00 TO NODE 202/1.00 TS CODE - /T
* 100 YEAR RAINFALL IN	,	_H/HK) = 1	. 193			
SUBAREA LOSS RATE DATA		3003	Ti	7	000	>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
DEVELOPMENT TYPE/	SCS SOIL		Fp	Ap	SCS	>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
LAND USE	GROUP	(ACRES) (	INCH/HR)	(DECIMAL)	CN	
RESIDENTIAL	-	100 00	0.75	0 000	F.C	UNIT-HYDROGRAPH DATA:
".4 DWELLING/ACRE"	В	100.00	0.75	0.900	56	RAINFALL (INCH): 5M= 0.40;30M= 0.82;1H= 1.09;3H= 1.77;6H= 2.41;24H= 6.18
RESIDENTIAL	-	07.10	0 75	0 000	F.C.	S-GRAPH: VALLEY(DEV.) = 28.6%; VALLEY(UNDEV.) / DESERT = 71.4%
".4 DWELLING/ACRE"	В	27.18	0.75	0.900	56	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.)= 0.0%
RESIDENTIAL	_					Tc(HR) = 0.54; LAG(HR) = 0.43; Fm(INCH/HR) = 0.61; Ybar = 0.60
"3-4 DWELLINGS/ACRE"	В	11.00	0.75	0.600	56	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
RESIDENTIAL	_	40				DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
"2 DWELLINGS/ACRE"	В	18.36	0.75	0.700	56	3HR = 1.00; 6HR = 1.00; 24HR= 1.00
NATURAL FAIR COVER						UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 685.7
D	F.11				D 40	D 1 01/01/0011

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 50

Date: 04/21/2014

File name: LR0202ZZ.RES

```
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0542; Lca/L=0.4,n=.0485; Lca/L=0.5,n=.0446; Lca/L=0.6,n=.0416
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 154.43
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 617.85
 TOTAL PEAK FLOW RATE (CFS) = 617.85 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 742.90
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 742.90)
 PEAK FLOW RATE (CFS) USED = 742.90
******************
 FLOW PROCESS FROM NODE 20271.00 TO NODE 20272.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1755.00 DOWNSTREAM ELEVATION(FEET) = 1730.00
 STREET LENGTH (FEET) = 1359.40 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.98
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.42
   HALFSTREET FLOOD WIDTH (FEET) = 69.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.63
 STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 34.73
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.735
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                          Fρ
                                                   αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 92.29
                                           0.75 0.900 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.58
                                           0.75
                                                 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.883
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.80;6H= 2.45;24H= 6.28
 S-GRAPH: VALLEY(DEV.) = 25.8%; VALLEY(UNDEV.) / DESERT= 74.2%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.62; Ybar = 0.60
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 783.6
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20272.00 = 10245.93 FEET.
```

```
Lca/L=0.3,n=.0588; Lca/L=0.4,n=.0527; Lca/L=0.5,n=.0484; Lca/L=0.6,n=.0452
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 178.37
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 673.32
 TOTAL AREA (ACRES) = 783.6
                                  PEAK FLOW RATE (CFS) = 742.90
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.91
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.39 HALFSTREET FLOOD WIDTH(FEET) = 68.09
 FLOW VELOCITY (FEET/SEC.) = 8.77 DEPTH*VELOCITY (FT*FT/SEC.) = 12.18
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.98
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.71
 PIPE-FLOW(CFS) = 529.61
 PIPEFLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 33.39
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.80;6H= 2.45;24H= 6.28
 S-GRAPH: VALLEY (DEV.) = 25.8%; VALLEY (UNDEV.) / DESERT= 74.2%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.54; LAG(HR) = 0.43; Fm(INCH/HR) = 0.62; Ybar = 0.60
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
                                                783.6
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20272.00 = 11605.33 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0484; Lca/L=0.4,n=.0434; Lca/L=0.5,n=.0398; Lca/L=0.6,n=.0372
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 178.37
 TOTAL AREA(ACRES) = 783.6
                                  PEAK FLOW RATE (CFS) = 742.90
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.91
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 213.29
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.95
   HALFSTREET FLOOD WIDTH (FEET) = 45.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.90
******************
 FLOW PROCESS FROM NODE 20272.00 TO NODE 20273.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1730.00 DOWNSTREAM ELEVATION(FEET) = 1695.00
 STREET LENGTH (FEET) = 1247.53 CURB HEIGHT (INCHES) = 6.0
```

File name: LR0202ZZ.RES

Page 52

EOUIVALENT BASIN FACTOR APPROXIMATIONS:

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 51

DEPTH(FEET) = 1.32 HALFSTREET FLOOD WIDTH(FEET) = 59.21 FLOW VELOCITY (FEET/SEC.) = 10.49 DEPTH\*VELOCITY (FT\*FT/SEC.) = 13.88

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\*

```
ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.47
 PIPE-FLOW(CFS) = 583.95
 PIPEFLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 34.32
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.12;3H= 1.82;6H= 2.47;24H= 6.29
 S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT= 75.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.62; Ybar = 0.60
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 839.2
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20273.00 = 12852.86 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0459; Lca/L=0.4,n=.0411; Lca/L=0.5,n=.0378; Lca/L=0.6,n=.0353
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 190.65
 TOTAL AREA(ACRES) = 839.2
                                   PEAK FLOW RATE (CFS) = 742.90
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 158.95
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 32.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.81
******************
 FLOW PROCESS FROM NODE 20273.00 TO NODE 20274.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1695.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 797.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.30
   HALFSTREET FLOOD WIDTH (FEET) = 57.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.95
```

File name: LR020277.RFS

Page 54

Date: 04/21/2014

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 14.23
STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 35.53
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.712
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fр
                                                    Αp
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                      В
                                 2.08
                                           0.75
                                                    0.900 56
".4 DWELLING/ACRE"
                       B
                                 0.94
                                        0.75 0.600 56
SCHOOL
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.12;3H= 1.82;6H= 2.47;24H= 6.29
S-GRAPH: VALLEY (DEV.) = 24.4%; VALLEY (UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.62; Ybar = 0.60
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 842.2
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 12852.86 FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0491; Lca/L=0.4,n=.0440; Lca/L=0.5,n=.0404; Lca/L=0.6,n=.0377
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 191.40
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 718.88
TOTAL AREA (ACRES) = 842.2
                               PEAK FLOW RATE (CFS) = 742.90
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.30 HALFSTREET FLOOD WIDTH(FEET) = 57.93
FLOW VELOCITY (FEET/SEC.) = 10.95 DEPTH*VELOCITY (FT*FT/SEC.) = 14.22
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 23.75
PIPE-FLOW(CFS) = 617.24
PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 34.88
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.12;3H= 1.82;6H= 2.47;24H= 6.29
S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.62; Ybar = 0.60
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 842.2
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 13650.41 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3, n=.0448; Lca/L=0.4, n=.0401; Lca/L=0.5, n=.0369; Lca/L=0.6, n=.0344
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 191.40
TOTAL AREA (ACRES) = 842.2 PEAK FLOW RATE (CFS) = 742.90
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 125.66
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.71
  HALFSTREET FLOOD WIDTH (FEET) = 28.69
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.31
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.22
******************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 PEAK FLOW RATE (CFS) = 742.90 Tc (MIN.) = 34.88
 AREA-AVERAGED Fm(INCH/HR) = 0.62 Ybar = 0.60
 TOTAL AREA (ACRES) =
                   842.2
 ** CONFLUENCE DATA **
 STREAM
         O TC AREA
                              HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                  NODE
  1 2112.24 38.33 2259.75 20120.00
   2.
        742.90 34.88 842.18 20260.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.92;1H= 1.21;3H= 2.06;6H= 2.87;24H= 7.06
 S-GRAPH: VALLEY(DEV.) = 35.0%; VALLEY(UNDEV.) / DESERT = 65.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.59; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.86; 30M = 0.86; 1HR = 0.86;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0390; Lca/L=0.4,n=.0349; Lca/L=0.5,n=.0321; Lca/L=0.6,n=.0299
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 875.38
 PEAK FLOW RATE (CFS) = 2592.94
*****************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 3101.9 TC (MIN.) =
                                          38.33
 AREA-AVERAGED Fm (INCH/HR) = 0.59 Ybar = 0.54
 PEAK FLOW RATE (CFS) = 2592.94
```

Page 56

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

Date: 04/21/2014 File name: LR0202ZZ.RES Page 55 Date: 04/21/2014 File name: LR0202ZZ.RES

	DNAL/UNIT-HYDROGRAPH METHOD ANAI			
Date: 04/21/2014				

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20376

\* 100-YR HC ULTIMATE CONDITION OCT 2013 TMULI

\*

FILE NAME: LR0203ZZ.DAT

TIME/DATE OF STUDY: 14:08 10/16/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR	
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====				=====	=====	=====		
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc S-GRAPH TYPE PERCENTAGE (DECIMAL) 1.000 VALLEY (DEVELOPED) FOOTHILL 0.000 MOUNTAIN 0.000 VALLEY (UNDEVELOPED) / DESERT 0.000 DESERT (UNDEVELOPED) 0.000 PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20300.00 TO NODE 20301.00 IS CODE = 21 \_\_\_\_\_\_ >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 658.37 ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2400.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.287 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.100 SUBAREA To AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) NATURAL FAIR COVER B 6.22 0.61 1.000 66 12.01 "OPEN BRUSH" RESIDENTIAL ".4 DWELLING/ACRE" B 0.99 0.75 0.900 8.29 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.986 SUBAREA RUNOFF (CFS) = 22.57TOTAL AREA(ACRES) = 7.21 PEAK FLOW RATE(CFS) = 22.57 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20301.00 TO NODE 20302.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> Date: 04/21/2014 File name: LR0203ZZ.RES Page 2

Date: 04/21/2014 File name: LR0203ZZ.RES Page 1

```
ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2380.00
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LAND USE
 CHANNEL LENGTH THRU SUBAREA (FEET) = 422.45 CHANNEL SLOPE = 0.0473
                                                                            NATURAL FAIR COVER
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                            "OPEN BRUSH"
                                                                                                 B 4.15
                                                                                                                 0.61
                                                                                                                       1.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE"
                                                                                                 В
                                                                                                    0.80
                                                                                                                0.75 0.900
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               22.57
 FLOW VELOCITY (FEET/SEC.) = 2.53 FLOW DEPTH (FEET) = 0.42
                                                                            SCHOOL
                                                                                                 B 20.38
                                                                                                                0.75 0.600
 TRAVEL TIME (MIN.) = 2.78 Tc (MIN.) = 11.07
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20302.00 = 1080.82 FEET.
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
                                                                            SUBAREA AREA(ACRES) = 25.33
                                                                                                        SUBAREA RUNOFF (CFS) = 53.39
*******************
                                                                            EFFECTIVE AREA(ACRES) = 40.46 AREA-AVERAGED Fm(INCH/HR) = 0.52
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20302.00 IS CODE = 81
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.76
                                                                            TOTAL AREA (ACRES) = 40.5 PEAK FLOW RATE (CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 11.07
                                                                            5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.446
                                                                          ******************
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            FLOW PROCESS FROM NODE 20303.00 TO NODE 20304.00 IS CODE = 54
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS
                                              Ар
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 ".4 DWELLING/ACRE"
                    В
                             0.12
                                      0.75
                                             0.900
                                                    56
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 NATURAL FAIR COVER
                                                                          _____
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 2320.00 DOWNSTREAM(FEET) = 2280.00
 "OPEN BRUSH"
                       В
                             4.14
                                      0.61
                                           1.000
                                                   66
 SCHOOL
                       В
                              3.66
                                      0.75
                                             0.600
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 981.07 CHANNEL SLOPE = 0.0408
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                            CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                            MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
 SUBAREA AREA (ACRES) = 7.92
                             SUBAREA RUNOFF (CFS) = 20.72
                                                                            CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                         83.98
 EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.58
                                                                            FLOW VELOCITY (FEET/SEC.) = 3.36 FLOW DEPTH (FEET) = 0.71
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.90
                                                                            TRAVEL TIME (MIN.) = 4.86 Tc (MIN.) = 20.28
 TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) =
                                                    39.04
                                                                            LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20304.00 = 2932.57 FEET.
                                                                          ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                            FLOW PROCESS FROM NODE 20304.00 TO NODE 20304.00 IS CODE = 81
******************
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20303.00 IS CODE = 54
                                                                          _____
                                                                            MAINLINE Tc (MIN.) = 20.28
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.397
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
______
                                                                                                             Fp
 ELEVATION DATA: UPSTREAM(FEET) = 2380.00 DOWNSTREAM(FEET) = 2320.00
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 870.68 CHANNEL SLOPE = 0.0689
                                                                            NATURAL FAIR COVER
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                            "OPEN BRUSH"
                                                                                                В
                                                                                                       18.37
                                                                                                                0.61 1.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                                                      15.66
                                                                                                              0.75 0.600
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             39.04
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 FLOW VELOCITY (FEET/SEC.) = 3.34 FLOW DEPTH (FEET) = 0.48
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.816
                                                                                                     SUBAREA RUNOFF (CFS) = 56.92
 TRAVEL TIME (MIN.) = 4.34 Tc (MIN.) = 15.42
                                                                            SUBAREA AREA(ACRES) = 34.03
                                                                            EFFECTIVE AREA(ACRES) = 74.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20303.00 = 1951.50 FEET.
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
*****************
                                                                            TOTAL AREA (ACRES) = 74.5 PEAK FLOW RATE (CFS) = 125.31
 FLOW PROCESS FROM NODE 20303.00 TO NODE 20303.00 IS CODE = 81
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
______
                                                                          MAINLINE Tc(MIN.) = 15.42
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.825
                                                                            FLOW PROCESS FROM NODE 20304.00 TO NODE 20305.00 IS CODE = 54
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                                                           >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 3

Date: 04/21/2014 File name: LR020377.RFS

SCS

66

66

83.98

```
SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fρ
                                                                                                                             SCS
                                                                                                                       Αp
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2220.00
                                                                              LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 823.37 CHANNEL SLOPE = 0.0729
                                                                          RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          "2 DWELLINGS/ACRE"
                                                                                                     1.66
                                                                                                               0.75
                                                                                                                      0.700
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                          NATURAL FAIR COVER
                                                                                                   13.33
 CHANNEL FLOW THRU SUBAREA(CFS) = 125.31
                                                                          "OPEN BRUSH"
                                                                                              В
                                                                                                               0.61 1.000
                                                                                                                             66
                                                                                                     2.17
 FLOW VELOCITY (FEET/SEC.) = 4.61 FLOW DEPTH (FEET) = 0.74
                                                                           SCHOOL
                                                                                                В
                                                                                                               0.75 0.600
 TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 23.25
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20305.00 = 3755.94 FEET.
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.920
                                                                           SUBAREA AREA(ACRES) = 17.16 SUBAREA RUNOFF(CFS) = 22.21
******************
                                                                          EFFECTIVE AREA(ACRES) = 109.51 AREA-AVERAGED Fm(INCH/HR) = 0.54
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20305.00 IS CODE = 81
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                           TOTAL AREA (ACRES) = 109.5
............
                                                                                                       PEAK FLOW RATE (CFS) = 146.27
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 23.25
                                                                           5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.208
                                                                         ******************
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fρ
                                                                           FLOW PROCESS FROM NODE 20306.00 TO NODE 20307.00 IS CODE = 54
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                  66
 "OPEN BRUSH"
                     В
                             9.94
                                     0.61
                                           1.000
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 RESIDENTIAL
                                                                         ______
 "2 DWELLINGS/ACRE" B 0.01
                                   0.75
                                            0.700
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2185.00
                             7.91
 SCHOOL
                      В
                                     0.75
                                            0.600 56
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 181.13 CHANNEL SLOPE = 0.0276
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.823
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AREA(ACRES) = 17.86
                             SUBAREA RUNOFF (CFS) = 26.79
                                                                          CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                      146.27
 EFFECTIVE AREA(ACRES) = 92.35 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                          FLOW VELOCITY (FEET/SEC.) = 3.30 FLOW DEPTH (FEET) = 0.94
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
                                                                          TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 27.82
 TOTAL AREA (ACRES) = 92.3
                            PEAK FLOW RATE (CFS) = 139.43
                                                                          LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20307.00 = 4739.04 FEET.
                                                                         *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                          FLOW PROCESS FROM NODE 20307.00 TO NODE 20307.00 IS CODE = 81
*********************
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20306.00 IS CODE = 54
                                                                         _____
______
                                                                          MAINLINE Tc(MIN.) = 27.82
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.982
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                          SUBAREA LOSS RATE DATA (AMC II):
______
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fp
                                                                                                                     Дp
 ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2190.00
                                                                              LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 801.97 CHANNEL SLOPE = 0.0374
                                                                          RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                                                      0.700
                                                                           "2 DWELLINGS/ACRE"
                                                                                                В 1.33
                                                                                                               0.75
                                                                                                                             56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                          RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA(CFS) = 139.43
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                             в 0.26
                                                                                                               0.75
                                                                                                                      0.600
                                                                                                                             56
 FLOW VELOCITY (FEET/SEC.) = 3.66 FLOW DEPTH (FEET) = 0.87
                                                                          NATURAL FAIR COVER
 TRAVEL TIME (MIN.) = 3.65 Tc (MIN.) = 26.90
                                                                           "OPEN BRUSH"
                                                                                                В
                                                                                                       3.26
                                                                                                               0.61 1.000
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20306.00 = 4557.91 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.896
SUBAREA AREA(ACRES) = 4.85
                                                                                                      SUBAREA RUNOFF (CFS) = 6.12
 FLOW PROCESS FROM NODE 20306.00 TO NODE 20306.00 IS CODE = 81
                                                                          EFFECTIVE AREA(ACRES) = 114.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.82
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           TOTAL AREA(ACRES) = 114.4 PEAK FLOW RATE(CFS) =
                                                                                                                          148.43
______
 MAINLINE Tc (MIN.) = 26.90
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.023
                                                                           5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 5

File name: LR0203ZZ.RES Page 6

Date: 04/21/2014

```
*******************
 FLOW PROCESS FROM NODE 20307.00 TO NODE 20308.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 ELEVATION DATA: UPSTREAM(FEET) = 2185.00 DOWNSTREAM(FEET) = 2175.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 269.83 CHANNEL SLOPE = 0.0371
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            148.43
 FLOW VELOCITY (FEET/SEC.) = 3.70 FLOW DEPTH (FEET) = 0.90
 TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 29.03
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20308.00 = 5008.87 FEET.
*******************
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20308.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 29.03
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.932
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 2.10
                                     0.75
                                            0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65
                                     0.75
                                            0.600
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                           1.26
                                     0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778
 SUBAREA AREA (ACRES) = 4.01 SUBAREA RUNOFF (CFS) = 5.03
 EFFECTIVE AREA(ACRES) = 118.37 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 118.4 PEAK FLOW RATE (CFS) = 148.43
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
*****************
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20309.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2175.00 DOWNSTREAM ELEVATION(FEET) = 2150.00
 STREET LENGTH (FEET) = 430.92 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 151.82
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.63
 STREET FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 29.78
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.903
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Aр
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 1.71 0.61
                                               1.000
                                                        66
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 2.80
                                        0.75
                                                0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             1.00 0.75 0.600
                                                        56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
 SUBAREA AREA (ACRES) = 5.51 SUBAREA RUNOFF (CFS) = 6.77
 EFFECTIVE AREA(ACRES) = 123.88 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 123.9 PEAK FLOW RATE (CFS) = 151.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.69 HALFSTREET FLOOD WIDTH (FEET) = 27.41
 FLOW VELOCITY (FEET/SEC.) = 9.64 DEPTH*VELOCITY (FT*FT/SEC.) = 6.64
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20309.00 = 5439.79 FEET.
*****************
 FLOW PROCESS FROM NODE 20309.00 TO NODE 20310.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2150.00 DOWNSTREAM ELEVATION(FEET) = 2140.00
 STREET LENGTH (FEET) = 330.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
```

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0203ZZ.RES Page 7 Date: 04/21/2014 File name: LR0203ZZ.RES Page 8

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 155.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.38
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.83
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 30.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.876
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Ap
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.69
                                                 0.700
                                         0.75
                                                       56
 NATURAL FAIR COVER
                        B 0.85
                                         0.61
                                                1.000
 "OPEN BRUSH"
                                                       66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.79
                                        0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.733
 SUBAREA AREA (ACRES) = 5.33 SUBAREA RUNOFF (CFS) = 6.47
 EFFECTIVE AREA(ACRES) = 129.21 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 129.2 PEAK FLOW RATE (CFS) = 155.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.38
 FLOW VELOCITY (FEET/SEC.) = 7.61 DEPTH*VELOCITY (FT*FT/SEC.) = 5.84
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20310.00 = 5769.89 FEET.
*****************
 FLOW PROCESS FROM NODE 20310.00 TO NODE 20311.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2140.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
 STREET LENGTH (FEET) = 329.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 158.45
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.18
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 12.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.95
 STREET FLOW TRAVEL TIME (MIN.) = 0.43 Tc (MIN.) = 30.93
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.860
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                       В 2.87
 "2 DWELLINGS/ACRE"
                                           0.75
                                                   0.700
                                                           56
 NATURAL FAIR COVER
                        в 1.50
                                           0.61 1.000
 "OPEN BRUSH"
                                                           66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.78 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.772
 SUBAREA AREA (ACRES) = 5.15 SUBAREA RUNOFF (CFS) = 6.13
 EFFECTIVE AREA(ACRES) = 134.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 134.4 PEAK FLOW RATE (CFS) = 159.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.24
 FLOW VELOCITY (FEET/SEC.) = 12.79 DEPTH*VELOCITY (FT*FT/SEC.) = 7.99
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 23.11
 PIPE-FLOW(CFS) = 72.66
 PIPEFLOW TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 30.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.867
 SUBAREA AREA(ACRES) = 5.15 SUBAREA RUNOFF(CFS) = 6.16
 TOTAL AREA (ACRES) = 134.4 PEAK FLOW RATE (CFS) = 160.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 87.87
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.48
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.59
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20311.00 = 6099.39 FEET.
******************
 FLOW PROCESS FROM NODE 20311.00 TO NODE 20312.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

>>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014 File name: LR0203ZZ.RES Page 9 Date: 04/21/2014 File name: LR0203ZZ.RES Page 10

```
UPSTREAM ELEVATION(FEET) = 2100.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
STREET LENGTH (FEET) = 476.59 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.61
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 166.67
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.67
 HALFSTREET FLOOD WIDTH (FEET) = 26.50
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.28
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 7.56
STREET FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 31.44
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.842
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"2 DWELLINGS/ACRE"
                      B 4.27
                                          0.75
                                                   0.700
                                                         56
NATURAL FAIR COVER
                         B 5.25
"OPEN BRUSH"
                                          0.61 1.000
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.13
                                        0.75 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.837
SUBAREA AREA (ACRES) = 10.65 SUBAREA RUNOFF (CFS) = 12.29
EFFECTIVE AREA(ACRES) = 145.01 AREA-AVERAGED Fm(INCH/HR) = 0.54
AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
TOTAL AREA (ACRES) = 145.0 PEAK FLOW RATE (CFS) = 169.77
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.68
FLOW VELOCITY (FEET/SEC.) = 11.34 DEPTH*VELOCITY (FT*FT/SEC.) = 7.64
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.61
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 20.78
PIPE-FLOW(CFS) = 82.71
PIPEFLOW TRAVEL TIME (MIN.) = 0.38 Tc(MIN.) = 31.12
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.853
SUBAREA AREA(ACRES) = 10.65 SUBAREA RUNOFF(CFS) = 12.39
TOTAL AREA(ACRES) = 145.0
                                 PEAK FLOW RATE (CFS) = 171.26
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 88.55
  ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.88
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.37
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.22
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20312.00 = 6575.98 FEET.
*******************
 FLOW PROCESS FROM NODE 20312.00 TO NODE 20313.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 500.29 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 177.29
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.68
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 32.08
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.820
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                      B 6.45
 "2 DWELLINGS/ACRE"
                                         0.75
                                                 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 1.19
                                         0.75 0.600
 NATURAL FAIR COVER
                        В 2.82 0.61 1.000
 "OPEN BRUSH"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.770
 SUBAREA AREA (ACRES) = 10.46 SUBAREA RUNOFF (CFS) = 12.05
 EFFECTIVE AREA(ACRES) = 155.47 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 155.5 PEAK FLOW RATE (CFS) = 178.96
```

Page 12

Date: 04/21/2014 File name: LR0203ZZ.RES Page 11 Date: 04/21/2014 File name: LR0203ZZ.RES

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.44
 FLOW VELOCITY(FEET/SEC.) = 8.73 DEPTH*VELOCITY(FT*FT/SEC.) = 6.71
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 16.40
 PIPE-FLOW(CFS) =
                    97.48
 PIPEFLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 31.63
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.835
 SUBAREA AREA(ACRES) = 10.46 SUBAREA RUNOFF(CFS) = 12.20
 TOTAL AREA (ACRES) = 155.5 PEAK FLOW RATE (CFS) = 181.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 83.63
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.34
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20313.00 = 7076.27 FEET.
******************
 FLOW PROCESS FROM NODE 20313.00 TO NODE 20314.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 462.82 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 187.14
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.50
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.09
       Date: 04/21/2014
                                                          Page 13
```

File name: LR020377.RFS

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.00
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 32.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.807
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                      в 3.76
 "OPEN BRUSH"
                                         0.61
                                                1.000
 RESIDENTIAL
                      В 5.77
                                        0.75 0.700
                                                        56
 "2 DWELLINGS/ACRE"
 RESIDENTIAL
                             1.10
 "3-4 DWELLINGS/ACRE"
                      B
                                        0.75 0.600
                                                        56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.796
 SUBAREA AREA(ACRES) = 10.63
                              SUBAREA RUNOFF(CFS) = 12.04
 EFFECTIVE AREA(ACRES) = 166.10 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 166.1 PEAK FLOW RATE (CFS) =
                                                      189.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.32
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.62
 FLOW VELOCITY (FEET/SEC.) = 9.12 DEPTH*VELOCITY (FT*FT/SEC.) = 7.05
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.05
 PIPE-FLOW(CFS) = 101.35
 PIPEFLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 32.08
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.820
 SUBAREA AREA (ACRES) = 10.63 SUBAREA RUNOFF (CFS) = 12.17
 TOTAL AREA (ACRES) = 166.1 PEAK FLOW RATE (CFS) = 191.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.32
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 89.75
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.59
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20314.00 = 7539.09 FEET.
FLOW PROCESS FROM NODE 20314.00 TO NODE 20315.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 1980.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 14

```
STREET LENGTH (FEET) = 511.41 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 196.34
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.71
 HALFSTREET FLOOD WIDTH (FEET) = 28.57
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.51
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.19
STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 32.82
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.795
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                   Αp
                                                          SCS
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 6.85
                                          0.75
                                                   0.700
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.24
                                          0.75
                                                  0.600
                                                          56
NATURAL FAIR COVER
"OPEN BRUSH"
                         В
                               1.05
                                          0.61
                                                 1.000 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.721
SUBAREA AREA (ACRES) = 9.14 SUBAREA RUNOFF (CFS) = 10.46
EFFECTIVE AREA(ACRES) = 175.24 AREA-AVERAGED Fm(INCH/HR) = 0.54
AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.80
TOTAL AREA (ACRES) = 175.2 PEAK FLOW RATE (CFS) = 197.87
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.01
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.69
FLOW VELOCITY (FEET/SEC.) = 11.50 DEPTH*VELOCITY (FT*FT/SEC.) = 8.21
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 21.52
PIPE-FLOW(CFS) = 105.75
PIPEFLOW TRAVEL TIME (MIN.) = 0.40 Tc (MIN.) = 32.48
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.807
SUBAREA AREA(ACRES) = 9.14 SUBAREA RUNOFF(CFS) = 10.55
TOTAL AREA (ACRES) = 175.2 PEAK FLOW RATE (CFS) = 199.66
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.01
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 93.91
  ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.61
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.33
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20315.00 = 8050.50 FEET.
******************
 FLOW PROCESS FROM NODE 20315.00 TO NODE 20316.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1980.00 DOWNSTREAM ELEVATION(FEET) = 1950.00
 STREET LENGTH (FEET) = 522.61 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.83
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.81
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 33.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.779
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.12 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.25 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 7.37 SUBAREA RUNOFF (CFS) = 8.41
 EFFECTIVE AREA(ACRES) = 182.61 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 182.6 PEAK FLOW RATE (CFS) =
                                                          203.73
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.62
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 15 Date: 04/21/2014 File name: LR0203ZZ.RES Page 16

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.83
 FLOW VELOCITY (FEET/SEC.) = 10.32 DEPTH*VELOCITY (FT*FT/SEC.) = 7.81
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.65
 PIPE-FLOW(CFS) = 116.82
 PIPEFLOW TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 32.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.792
 SUBAREA AREA (ACRES) = 7.37 SUBAREA RUNOFF (CFS) = 8.50
 TOTAL AREA (ACRES) = 182.6 PEAK FLOW RATE (CFS) = 205.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.62
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 89.04
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.59
   HALFSTREET FLOOD WIDTH (FEET) = 22.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.86
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20316.00 = 8573.11 FEET.
******************
 FLOW PROCESS FROM NODE 20316.00 TO NODE 20317.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
 STREET LENGTH (FEET) = 743.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.62
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 209.05
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.82
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.54
 STREET FLOW TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 33.97
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.758
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Αp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.10
                                         0.75
                                                 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.55
                                         0.75
                                                 0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.01 0.75 0.900
                                                         56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
 SUBAREA AREA (ACRES) = 5.66 SUBAREA RUNOFF (CFS) = 6.39
 EFFECTIVE AREA (ACRES) = 188.27 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 188.3 PEAK FLOW RATE (CFS) = 206.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.00
 FLOW VELOCITY (FEET/SEC.) = 11.78 DEPTH*VELOCITY (FT*FT/SEC.) = 8.48
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.30
 PIPE-FLOW(CFS) = 138.50
 PIPEFLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 33.45
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.775
 SUBAREA AREA (ACRES) = 5.66 SUBAREA RUNOFF (CFS) = 6.48
 TOTAL AREA(ACRES) = 188.3
                                PEAK FLOW RATE (CFS) = 209.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 71.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.42
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.54
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20317.00 = 9316.69 FEET.
FLOW PROCESS FROM NODE 20317.00 TO NODE 20318.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00
 STREET LENGTH (FEET) = 640.63 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 17

File name: LR0203ZZ.RES

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 216.13
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.80
 HALFSTREET FLOOD WIDTH (FEET) = 32.84
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.69
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.72
STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 34.56
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.741
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                                         Fρ
                                                    Αp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.10
                                          0.75
                                                   0.600
                                                           56
RESIDENTIAL
".4 DWELLING/ACRE"
                      в 0.01
                                          0.75
                                                   0.900
                                                           56
RESIDENTIAL
                       B 10.92
                                          0.75 0.700 56
"2 DWELLINGS/ACRE"
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
SUBAREA AREA (ACRES) = 12.03 SUBAREA RUNOFF (CFS) = 13.25
EFFECTIVE AREA(ACRES) = 200.30 AREA-AVERAGED Fm(INCH/HR) = 0.54
AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
TOTAL AREA (ACRES) = 200.3 PEAK FLOW RATE (CFS) = 216.97
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.84
FLOW VELOCITY (FEET/SEC.) = 9.73 DEPTH*VELOCITY (FT*FT/SEC.) = 7.75
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 19.84
PIPE-FLOW(CFS) = 164.73
PIPEFLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 33.99
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.758
SUBAREA AREA(ACRES) = 12.03 SUBAREA RUNOFF(CFS) = 13.44
TOTAL AREA (ACRES) = 200.3
                                 PEAK FLOW RATE (CFS) = 220.08
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
```

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.50
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20318.00 = 9957.32 FEET.
************************
 FLOW PROCESS FROM NODE 20318.00 TO NODE 20319.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1835.00
 STREET LENGTH (FEET) = 624.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   304.05
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.91
   HALFSTREET FLOOD WIDTH (FEET) = 38.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.06
 STREET FLOW TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 35.04
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.726
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                   Αp
                                                         SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.46
                                          0.75
                                                  0.600
                                                          56
 RESIDENTIAL
                  В 9.05
 ".4 DWELLING/ACRE"
                                          0.75
                                                  0.900
                                                          56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 100.00
                                          0.75
                                                  0.700
                                                          56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                               28.82
                                          0.75
                                                  0.700
 NATURAL FAIR COVER
  "OPEN BRUSH"
                         B 18.27
                                          0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.745
 SUBAREA AREA (ACRES) = 157.60 SUBAREA RUNOFF (CFS) = 167.95
 EFFECTIVE AREA(ACRES) = 357.90 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 357.9
                                 PEAK FLOW RATE(CFS) =
                                                          382.30
```

STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 55.35

Date: 04/21/2014 File name: LR0203ZZ.RES Page 19 Date: 04/21/2014 File name: LR0203ZZ.RES Page 20

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.68
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 42.43
 FLOW VELOCITY (FEET/SEC.) = 10.41 DEPTH*VELOCITY (FT*FT/SEC.) = 10.29
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 36.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.03
 PIPE-FLOW(CFS) = 220.08
 PIPEFLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 34.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.744
 SUBAREA AREA (ACRES) = 157.60 SUBAREA RUNOFF (CFS) = 170.49
 TOTAL AREA (ACRES) = 357.9 PEAK FLOW RATE (CFS) = 388.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.68
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 167.99
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.48
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 624.0 FT WITH ELEVATION-DROP = 25.0 FT, IS 433.8 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20319.00
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20319.00 = 10581.32 FEET.
*******************
 FLOW PROCESS FROM NODE 20319.00 TO NODE 20330.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1835.00 DOWNSTREAM ELEVATION(FEET) = 1813.00
 STREET LENGTH (FEET) = 597.75 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 389.84
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH (FEET) = 1.03
   HALFSTREET FLOOD WIDTH (FEET) = 44.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.40
 STREET FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 35.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.715
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                       Fp
                                                   Αp
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.71 0.75 0.600
                                                           56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 2.91 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.841
 SUBAREA AREA (ACRES) = 3.62 SUBAREA RUNOFF (CFS) = 3.54
 EFFECTIVE AREA(ACRES) = 361.52 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 361.5 PEAK FLOW RATE (CFS) = 388.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.03 HALFSTREET FLOOD WIDTH(FEET) = 43.94
 FLOW VELOCITY (FEET/SEC.) = 10.11 DEPTH*VELOCITY (FT*FT/SEC.) = 10.36
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 20.20
 PIPE-FLOW(CFS) = 254.08
 PIPEFLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 34.94
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.729
 SUBAREA AREA(ACRES) = 3.62 SUBAREA RUNOFF(CFS) = 3.58
 TOTAL AREA(ACRES) = 361.5
                                 PEAK FLOW RATE (CFS) = 388.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 133.99
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.15
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.59
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.
FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
```

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<

Date: 04/21/2014 File name: LR0203ZZ.RES Page 22

```
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 34.94
 RAINFALL INTENSITY (INCH/HR) = 1.73
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.77
 EFFECTIVE STREAM AREA(ACRES) = 361.52
 TOTAL STREAM AREA (ACRES) = 361.52
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               388.07
******************
 FLOW PROCESS FROM NODE 20320.00 TO NODE 20321.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1020.45
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2180.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 19.882
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.425
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fp
                                                SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
                                 0.61 1.000 66 19.88
 "OPEN BRUSH"
                    В
                          9.71
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 15.83
 TOTAL AREA(ACRES) = 9.71 PEAK FLOW RATE(CFS) = 15.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
FLOW PROCESS FROM NODE 20321.00 TO NODE 20322.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2160.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 548.49 CHANNEL SLOPE = 0.0365
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 15.83
 FLOW VELOCITY (FEET/SEC.) = 2.12 FLOW DEPTH (FEET) = 0.39
 TRAVEL TIME (MIN.) = 4.31 Tc (MIN.) = 24.19
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20322.00 = 1568.94 FEET.
*****************
 FLOW PROCESS FROM NODE 20322.00 TO NODE 20322.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 24.19
```

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.156
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                    SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 15.34 0.61 1.000
                                                    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.02 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 15.36 SUBAREA RUNOFF (CFS) = 21.32
 EFFECTIVE AREA(ACRES) = 25.07 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 25.1
                              PEAK FLOW RATE(CFS) =
                                                    34.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.45; 30M = 0.92; 1HR = 1.21; 3HR = 2.00; 6HR = 2.75; 24HR = 7.29
******************
 FLOW PROCESS FROM NODE 20322.00 TO NODE 20323.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 479.58 CHANNEL SLOPE = 0.0209
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              34.79
 FLOW VELOCITY (FEET/SEC.) = 2.09 FLOW DEPTH (FEET) = 0.58
 TRAVEL TIME (MIN.) = 3.82 Tc (MIN.) = 28.01
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20323.00 = 2048.52 FEET.
*******************
 FLOW PROCESS FROM NODE 20323.00 TO NODE 20323.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 28.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.974
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           Αp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                          11.74
 "2 DWELLINGS/ACRE"
                      В
                                      0.75
                                             0.700
                                                    56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            8.32
                                     0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.824
 SUBAREA AREA(ACRES) = 20.06 SUBAREA RUNOFF(CFS) = 25.51
 EFFECTIVE AREA(ACRES) = 45.13 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.92
 TOTAL AREA (ACRES) = 45.1 PEAK FLOW RATE (CFS) =
                                                    56.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.45; 30M = 0.92; 1HR = 1.21; 3HR = 2.00; 6HR = 2.75; 24HR = 6.70
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 23 Date: 04/21/2014 File name: LR0203ZZ.RES Page 24

```
FLOW PROCESS FROM NODE 20323.00 TO NODE 20324.00 IS CODE = 54
                                                                         SUBAREA LOSS RATE DATA (AMC II):
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                    Αp
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                         RESIDENTIAL
                                                                         "2 DWELLINGS/ACRE"
                                                                                           В
                                                                                                  10.91 0.75 0.700
______
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2100.00
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CHANNEL LENGTH THRU SUBAREA (FEET) = 676.85 CHANNEL SLOPE = 0.0739
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                         SUBAREA AREA(ACRES) = 10.91
                                                                                                    SUBAREA RUNOFF (CFS) = 11.92
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         EFFECTIVE AREA(ACRES) = 70.78 AREA-AVERAGED Fm(INCH/HR) = 0.57
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             56.20
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 FLOW VELOCITY (FEET/SEC.) = 3.76 FLOW DEPTH (FEET) = 0.55
                                                                         TOTAL AREA (ACRES) = 70.8
                                                                                                     PEAK FLOW RATE(CFS) =
 TRAVEL TIME (MIN.) = 3.00 Tc (MIN.) = 31.01
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20324.00 = 2725.37 FEET.
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
                                                                       ********************
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20324.00 IS CODE = 81
                                                                         FLOW PROCESS FROM NODE 20325.00 TO NODE 20326.00 IS CODE = 54
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 MAINLINE Tc(MIN.) = 31.01
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.857
                                                                       ______
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2050.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                       Ap SCS
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 686.64 CHANNEL SLOPE = 0.0437
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 RESIDENTIAL
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                   B 14.74 0.75 0.700 56
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) =
 "2 DWELLINGS/ACRE"
                                                                                                    74.63
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         FLOW VELOCITY (FEET/SEC.) = 3.34 FLOW DEPTH (FEET) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
                                                                         TRAVEL TIME (MIN.) = 3.43 Tc (MIN.) = 38.08
                                                                         LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20326.00 = 4043.63 FEET.
 SUBAREA AREA (ACRES) = 14.74 SUBAREA RUNOFF (CFS) = 17.69
 EFFECTIVE AREA(ACRES) = 59.87 AREA-AVERAGED Fm(INCH/HR) = 0.57
                                                                       ******************
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 59.9
                            PEAK FLOW RATE(CFS) =
                                                                         FLOW PROCESS FROM NODE 20326.00 TO NODE 20326.00 IS CODE = 81
                                                  69.15
                                                                        ______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 5M = 0.46; 30M = 0.93; 1HR = 1.23; 3HR = 2.02; 6HR = 2.75; 24HR = 6.50
                                                                       ______
                                                                         MAINLINE Tc(MIN.) = 38.08
*********************
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.642
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20325.00 IS CODE = 54
                                                                         SUBAREA LOSS RATE DATA (AMC II):
______
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                   αA
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                         RESIDENTIAL
                                                                                            в 48.19
                                                                                                            0.75 0.700
______
                                                                         "2 DWELLINGS/ACRE"
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2080.00
                                                                         RESIDENTIAL
 CHANNEL LENGTH THRU SUBAREA (FEET) = 631.62 CHANNEL SLOPE = 0.0317
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                            В 0.06
                                                                                                            0.75 0.600
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
                                                                                                 SUBAREA RUNOFF(CFS) = 48.58
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                         SUBAREA AREA (ACRES) = 48.25
 FLOW VELOCITY (FEET/SEC.) = 2.89 FLOW DEPTH (FEET) = 0.69
                                                                         EFFECTIVE AREA(ACRES) = 119.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
 TRAVEL TIME (MIN.) = 3.64 Tc (MIN.) = 34.65
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20325.00 = 3356.99 FEET.
                                                                         TOTAL AREA (ACRES) = 119.0 PEAK FLOW RATE (CFS) = 117.11
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 FLOW PROCESS FROM NODE 20325.00 TO NODE 20325.00 IS CODE = 81
                                                                         5M = 0.44; 30M = 0.91; 1HR = 1.20; 3HR = 2.00; 6HR = 2.75; 24HR = 6.50
                                                                       >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         FLOW PROCESS FROM NODE 20326.00 TO NODE 20327.00 IS CODE = 54
 MAINLINE Tc(MIN.) = 34.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.738
                                                                        >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

Page 25

Date: 04/21/2014

File name: LR020377.RFS

Date: 04/21/2014 File name: LR020377.RFS SCS

74.63

56

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 2050.00 DOWNSTREAM(FEET) = 1990.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1389.79 CHANNEL SLOPE = 0.0432
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 117.11
 FLOW VELOCITY (FEET/SEC.) = 3.69 FLOW DEPTH (FEET) = 0.80
 TRAVEL TIME (MIN.) = 6.27 Tc (MIN.) = 44.35
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20327.00 = 5433.42 FEET.
*********************
 FLOW PROCESS FROM NODE 20327.00 TO NODE 20327.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 44.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.499
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                   ďΨ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                          16.19 0.75 0.700 56
 "2 DWELLINGS/ACRE"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 16.19
                             SUBAREA RUNOFF (CFS) = 14.21
 EFFECTIVE AREA(ACRES) = 135.22 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) =
                   135.2
                              PEAK FLOW RATE (CFS) = 117.11
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20327.00 TO NODE 20328.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1920.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1079.99 CHANNEL SLOPE = 0.0648
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 117.11
 FLOW VELOCITY (FEET/SEC.) = 4.31 FLOW DEPTH (FEET) = 0.74
 TRAVEL TIME (MIN.) = 4.18 Tc (MIN.) = 48.52
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20328.00 = 6513.41 FEET.
******************
 FLOW PROCESS FROM NODE 20328.00 TO NODE 20328.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 48.52
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.420
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                                    SCS
                                                                                  Date: 04/21/2014
```

LAND USE RESIDENTIAL	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
"2 DWELLINGS/ACRE" RESIDENTIAL	В	25.33	0.75	0.700	56
"3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU					56
SUBAREA AVERAGE PERVIOU	S AREA FF	RACTION, A	p = 0.699		_
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) =	160.8	32 AREA-	AVERAGED Fm	(INCH/HR) =	
AREA-AVERAGED Fp(INCH/H TOTAL AREA(ACRES) =					127.02
SUBAREA AREA-AVERAGED R	AINFALL I	EPTH (INCH	):		
5M = 0.46; 30M = 0.95;	1HR = 1.2	25; 3HR =	2.03; 6HR =	2.75; 24HR	= 6.50
**************************************	20328.00	TO NODE	20329.00 I	S CODE = 6	
>>>>COMPUTE STREET FLO >>>> (STREET TABLE SECT	W TRAVEL ION # 5	TIME THRU USED) <<<<	SUBAREA<<<	<<	
UPSTREAM ELEVATION (FEET STREET LENGTH (FEET) = STREET HALFWIDTH (FEET)	) = 1920. 1075.25	00 DOWNS	TREAM ELEVA	TION (FEET)	
		CDADEDDE	AV (PPPM) —	10.00	
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFAL	(DECIMAL)	= 0.020	, ,	10.00	
SPECIFIED NUMBER OF HAL STREET PARKWAY CROSSFAL Manning's FRICTION FACT Manning's FRICTION FACT MAXIMUM ALLOWABLE STREE	L(DECIMAI OR for St OR for Ba	creetflow ack-of-Wal	20 Section(cur k Flow Sect	b-to-curb)	
**TRAVEL TIME COMPUTE				132.38	
***STREET FLOWING FUL STREETFLOW MODEL RESU	L***			102.00	
STREET FLOW DEPTH(FEE	T) = 0.6	58	D FLOW.		
HALFSTREET FLOOD WIDT AVERAGE FLOW VELOCITY	(FEET/SEC	2.) = 8			
PRODUCT OF DEPTH&VELO STREET FLOW TRAVEL TIME				50.62	
* 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(	AMC II):				
DEVELOPMENT TYPE/ LAND USE	SCS SOII GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "2 DWELLINGS/ACRE"					
SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU	S LOSS RA	ATE, Fp(IN	CH/HR) = 0		
SUBAREA AREA(ACRES) =	13.84	SUBARE	A RUNOFF(CF		
EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H	R) = 0.7	1 AREA-A	VERAGED Ap	= 0.76	
TOTAL AREA (ACRES) =				(CFS) =	132.59
SUBAREA AREA-AVERAGED R 5M = 0.46; 30M = 0.95;				2.75; 24HR	= 6.50

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.17
                                                                                SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 FLOW VELOCITY (FEET/SEC.) = 8.56 DEPTH*VELOCITY (FT*FT/SEC.) = 5.85
                                                                                ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20329.00 = 7588.66 FEET.
                                                                                ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
                                                                                ASSUME FULL-FLOWING PIPELINE
*************************
                                                                                PIPE-FLOW VELOCITY (FEET/SEC.) = 16.44
 FLOW PROCESS FROM NODE 20329.00 TO NODE 20330.00 IS CODE = 63
                                                                                PIPE-FLOW(CFS) = 51.70
_____
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 51.56
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.369
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                SUBAREA AREA (ACRES) = 17.63 SUBAREA RUNOFF (CFS) = 12.65
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                TOTAL AREA(ACRES) = 192.3 PEAK FLOW RATE(CFS) = 142.86
 UPSTREAM ELEVATION (FEET) = 1870.00 DOWNSTREAM ELEVATION (FEET) = 1813.00
 STREET LENGTH (FEET) = 927.52 CURB HEIGHT (INCHES) = 6.0
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HALFWIDTH (FEET) = 18.00
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 91.16
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  ***STREET FLOWING FULL***
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH (FEET) = 0.59
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.35
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.50
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.99
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20330.00 = 8516.18 FEET.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.66
                                                                               *******************
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.83
                                                                                FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
   ***STREET FLOWING FULL***
                                                                               ______
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
   STREET FLOW DEPTH (FEET) = 0.66
                                                                                >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                               ______
   HALFSTREET FLOOD WIDTH (FEET) = 26.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.61
                                                                                TOTAL NUMBER OF STREAMS = 2
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.38
                                                                                CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 STREET FLOW TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 52.23
                                                                                TIME OF CONCENTRATION (MIN.) = 51.56
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.358
                                                                                RAINFALL INTENSITY (INCH/HR) = 1.37
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.54
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.72
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                AREA-AVERAGED Ap = 0.76
                                                                                EFFECTIVE STREAM AREA(ACRES) = 192.29
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.48
                                        0.75
                                                0.600 56
                                                                                TOTAL STREAM AREA(ACRES) = 192.29
 RESIDENTIAL
                                                                                PEAK FLOW RATE (CFS) AT CONFLUENCE = 142.86
 ".4 DWELLING/ACRE"
                      в 5.88
                                        0.75
                                                0.900
                                                      56
 RESIDENTIAL
                                                                                ** CONFLUENCE DATA **
 "2 DWELLINGS/ACRE"
                      В 11.27
                                      0.75
                                                0.700
                                                                                 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 NUMBER
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 1
                                                                                         388.07 34.94 1.729 0.70(0.54)0.77 361.5 20300.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764
 SUBAREA AREA(ACRES) = 17.63 SUBAREA RUNOFF(CFS) = 12.49
                                                                                  2 142.86 51.56 1.369 0.72(0.54) 0.76 192.3 20320.00
 EFFECTIVE AREA(ACRES) = 192.29 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.76
                                                                                RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 TOTAL AREA (ACRES) = 192.3 PEAK FLOW RATE (CFS) = 141.03
                                                                                CONFLUENCE FORMULA USED FOR 2 STREAMS.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                ** PEAK FLOW RATE TABLE **
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                 STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                                 NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  1
                                                                                         527.10 34.94 1.729 0.71(0.54)0.77 491.8 20300.00
 DEPTH (FEET) = 0.67 HALFSTREET FLOOD WIDTH (FEET) = 26.37
                                                                                         413.39 51.56 1.369 0.71 (0.54) 0.77 553.8 20320.00
 FLOW VELOCITY (FEET/SEC.) = 9.63 DEPTH*VELOCITY (FT*FT/SEC.) = 6.43
```

Date: 04/21/2014 Date: 04/21/2014 File name: LR0203ZZ.RES File name: LR020377.RFS Page 29 Page 30

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

HEADWATER

```
PEAK FLOW RATE (CFS) = 527.10 Tc (MIN.) = 34.94
 EFFECTIVE AREA(ACRES) = 491.81 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 553.8
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.
******************
 FLOW PROCESS FROM NODE 20330.00 TO NODE 20349.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1813.00 DOWNSTREAM ELEVATION(FEET) = 1785.00
 STREET LENGTH (FEET) = 1334.61 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.25
   HALFSTREET FLOOD WIDTH (FEET) = 55.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 11.02
 STREET FLOW TRAVEL TIME (MIN.) = 2.52 Tc (MIN.) = 37.46
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.658
  SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              1.05
                                         0.75
                                                 0.600
                                                        56
 RESIDENTIAL
                       B 12.65
                                         0.75
                                                 0.700
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA AREA (ACRES) = 13.70 SUBAREA RUNOFF (CFS) = 14.06
 EFFECTIVE AREA(ACRES) = 505.51 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
 TOTAL AREA (ACRES) = 567.5 PEAK FLOW RATE (CFS) = 527.10
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.24 HALFSTREET FLOOD WIDTH(FEET) = 54.81
 FLOW VELOCITY (FEET/SEC.) = 8.81 DEPTH*VELOCITY (FT*FT/SEC.) = 10.94
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
```

```
THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.70
 PIPE-FLOW(CFS) = 347.84
 PIPEFLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 36.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.693
 SUBAREA AREA(ACRES) = 13.70
                            SUBAREA RUNOFF (CFS) = 14.49
 TOTAL AREA (ACRES) = 567.5
                              PEAK FLOW RATE (CFS) = 527.10
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 179.25
  ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.88
  HALFSTREET FLOOD WIDTH (FEET) = 36.74
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.69
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.90
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
******************
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 36.19
 RAINFALL INTENSITY (INCH/HR) = 1.69
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.76
 EFFECTIVE STREAM AREA(ACRES) = 505.51
 TOTAL STREAM AREA(ACRES) = 567.51
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 527.10
****************
 FLOW PROCESS FROM NODE 20340.00 TO NODE 20341.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 998.88
 ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 2080.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.422
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.216
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                      SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                               6.76
                                       0.75
                                               0.700 56 13.21
```

File name: LR0203ZZ.RES

Page 32

Date: 04/21/2014

Date: 04/21/2014 File name: LR0203ZZ.RES Page 31

```
RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  B 1.12 0.75 0.600 56 12.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA RUNOFF (CFS) = 19.17
 TOTAL AREA (ACRES) = 7.88 PEAK FLOW RATE (CFS) = 19.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.88; 1HR = 1.16; 3HR = 1.97; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20341.00 TO NODE 20342.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2055.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 397.26 CHANNEL SLOPE = 0.0629
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              19.17
 FLOW VELOCITY (FEET/SEC.) = 2.70 FLOW DEPTH (FEET) = 0.38
 TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 14.87
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20342.00 = 1396.14 FEET.
********************
 FLOW PROCESS FROM NODE 20342.00 TO NODE 20342.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 14.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.886
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 4.25
                                            0.700
                                     0.75
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.25
                                     0.75
                                           0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA(ACRES) = 4.50
                             SUBAREA RUNOFF (CFS) = 9.59
 EFFECTIVE AREA(ACRES) = 12.38 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 12.4
                            PEAK FLOW RATE(CFS) =
                                                    26.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.88; 1HR = 1.16; 3HR = 1.97; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20342.00 TO NODE 20343.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2035.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 438.38 CHANNEL SLOPE = 0.0456
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
```

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            26.42
 FLOW VELOCITY (FEET/SEC.) = 2.64 FLOW DEPTH (FEET) = 0.45
 TRAVEL TIME (MIN.) = 2.77 Tc (MIN.) = 17.64
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20343.00 = 1834.52 FEET.
********************
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20343.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 17.64
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.606
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                         Αр
                                               SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                  B 5.37
 "2 DWELLINGS/ACRE"
                                  0.75
                                        0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  B 0.37 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA (ACRES) = 5.74 SUBAREA RUNOFF (CFS) = 10.78
 EFFECTIVE AREA(ACRES) = 18.12 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 18.1 PEAK FLOW RATE (CFS) =
                                                34.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.44; 30M = 0.89; 1HR = 1.18; 3HR = 1.98; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20344.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.72 CHANNEL SLOPE = 0.0403
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 34.07
 FLOW VELOCITY (FEET/SEC.) = 2.66 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 3.12 Tc (MIN.) = 20.75
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20344.00 = 2331.24 FEET.
*******************
 FLOW PROCESS FROM NODE 20344.00 TO NODE 20344.00 IS CODE = 81
._____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 20.75
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.363
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fр
                                        Ар
                                               SCS
   LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                  В
                         2.06 0.75
                                         0.700
                                              56
 RESIDENTIAL
```

File name: LR020377.RFS

Page 34

Date: 04/21/2014

Date: 04/21/2014 File name: LR020377.RFS Page 33

```
".4 DWELLING/ACRE" B 2.77 0.75 0.900
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.07
                                     0.75 0.600 56
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1940.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 558.59 CHANNEL SLOPE = 0.0716
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.812
                                                                           CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 SUBAREA AREA(ACRES) = 4.90
                             SUBAREA RUNOFF (CFS) = 7.75
                                                                           MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 EFFECTIVE AREA(ACRES) = 23.02 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                           CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                        56.85
                                                                           FLOW VELOCITY (FEET/SEC.) = 3.73 FLOW DEPTH (FEET) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 23.0 PEAK FLOW RATE (CFS) =
                                                    37.87
                                                                           TRAVEL TIME (MIN.) = 2.50 Tc (MIN.) = 26.23
                                                                           LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20346.00 = 3464.89 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          ******************
 5M = 0.45; 30M = 0.92; 1HR = 1.21; 3HR = 2.00; 6HR = 2.75; 24HR = 6.50
                                                                            FLOW PROCESS FROM NODE 20346.00 TO NODE 20346.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 20344.00 TO NODE 20345.00 IS CODE = 54
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                          ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                           MAINLINE Tc(MIN.) = 26.23
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                           * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.053
_____
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2015.00 DOWNSTREAM(FEET) = 1980.00
                                                                            DEVELOPMENT TYPE/
                                                                                              SCS SOIL AREA
                                                                                                             ďΨ
 CHANNEL LENGTH THRU SUBAREA (FEET) = 575.06 CHANNEL SLOPE = 0.0609
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LAND USE
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                           RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           "2 DWELLINGS/ACRE"
                                                                                               В 3.53
                                                                                                                0.75
                                                                                                                       0.700
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              37.87
                                                                           RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 3.21 FLOW DEPTH (FEET) = 0.49
                                                                           "3-4 DWELLINGS/ACRE" B 0.62
                                                                                                                0.75
                                                                                                                       0.600
 TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 23.74
                                                                           RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20345.00 = 2906.30 FEET.
                                                                                                        3.41
                                                                           ".4 DWELLING/ACRE"
                                                                                            В
                                                                                                                0.75 0.900
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
******************
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.782
 FLOW PROCESS FROM NODE 20345.00 TO NODE 20345.00 IS CODE = 81
                                                                           SUBAREA AREA (ACRES) = 7.56 SUBAREA RUNOFF (CFS) = 9.99
                                                                           EFFECTIVE AREA(ACRES) = 46.14 AREA-AVERAGED Fm(INCH/HR) = 0.55
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
_____
                                                                           TOTAL AREA(ACRES) = 46.1 PEAK FLOW RATE(CFS) =
                                                                                                                             62.44
 MAINLINE Tc(MIN.) = 23.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.180
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                                                                          *******************
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            FLOW PROCESS FROM NODE 20346.00 TO NODE 20347.00 IS CODE = 63
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 12.00
                                      0.75
                                             0.700
                                                   56
                                                                          ______
 RESIDENTIAL
                                                                           >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                      В 0.27
                                             0.600
 "3-4 DWELLINGS/ACRE"
                                      0.75
                                                   56
                                                                           >>>> (STREET TABLE SECTION # 5 USED) <<<<
 RESIDENTIAL
                                                                          ______
 ".4 DWELLING/ACRE"
                            3.29
                                      0.75
                                             0.900
                                                                           UPSTREAM ELEVATION(FEET) = 1940.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
                                                                           STREET LENGTH (FEET) = 993.62 CURB HEIGHT (INCHES) = 6.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
                                                                           STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AREA(ACRES) = 15.56
                             SUBAREA RUNOFF(CFS) = 22.78
 EFFECTIVE AREA(ACRES) = 38.58 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                           DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                           INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 38.6 PEAK FLOW RATE (CFS) = 56.85
                                                                           OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                           STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                           Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                           MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 FLOW PROCESS FROM NODE 20345.00 TO NODE 20346.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                          69.09
      Date: 04/21/2014
                                                                                 Date: 04/21/2014
                                                                                                File name: LR0203ZZ.RES
```

Page 35

File name: LR020377.RFS

56

56

```
***STREET FLOWING FULL***
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.09
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.18 Tc (MIN.) = 30.70
  STREET FLOW DEPTH(FEET) = 0.56
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.869
  HALFSTREET FLOOD WIDTH (FEET) = 20.94
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.27
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.06
 STREET FLOW TRAVEL TIME (MIN.) = 2.28 Tc (MIN.) = 28.51
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 0.78
                                                                                                                          0.75
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.953
                                                                                                                                  0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
                                                                                  "2 DWELLINGS/ACRE" B 12.66 0.75 0.700
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.71
                                         0.75
                                                 0.600
                                                                                  SUBAREA AREA (ACRES) = 13.44 SUBAREA RUNOFF (CFS) = 16.32
                                                                                  EFFECTIVE AREA(ACRES) = 69.95 AREA-AVERAGED Fm(INCH/HR) = 0.54
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.04
                                         0.75
                                                 0.700
                                                       56
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
                                                                                  TOTAL AREA (ACRES) = 69.9 PEAK FLOW RATE (CFS) = 83.61
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В 1.62
                                        0.75
                                               0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 SUBAREA AREA(ACRES) = 10.37
                               SUBAREA RUNOFF(CFS) = 13.31
 EFFECTIVE AREA(ACRES) = 56.51 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                                  DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.12
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.76 DEPTH*VELOCITY (FT*FT/SEC.) = 4.21
 TOTAL AREA (ACRES) = 56.5 PEAK FLOW RATE (CFS) =
                                                          71.59
                                                                                  LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20348.00 = 5333.01 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                ******************
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  FLOW PROCESS FROM NODE 20348.00 TO NODE 20349.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                ______
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.19
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 FLOW VELOCITY (FEET/SEC.) = 7.37 DEPTH*VELOCITY (FT*FT/SEC.) = 4.16
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20347.00 = 4458.51 FEET.
                                                                                _____
                                                                                  UPSTREAM ELEVATION (FEET) = 1860.00 DOWNSTREAM ELEVATION (FEET) = 1785.00
******************
                                                                                  STREET LENGTH (FEET) = 1082.38 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20347.00 TO NODE 20348.00 IS CODE = 63
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00
 STREET LENGTH (FEET) = 874.50 CURB HEIGHT (INCHES) = 6.0
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.96
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH(FEET) = 0.60
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 22.83
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.23
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.50
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 79.75
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.96 Tc (MIN.) = 32.65
   ***STREET FLOWING FULL***
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.801
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.61
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
  HALFSTREET FLOOD WIDTH (FEET) = 23.69
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.67
                                                                                  RESIDENTIAL
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 37

Date: 04/21/2014 File name: LR0203ZZ.RES

"2 DWELLINGS/ACRE" B 33.09 0.75 0.700 56 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76TOTAL AREA (ACRES) = RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.55 0.75 0.600 56 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET. SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.698 SUBAREA AREA (ACRES) = 33.64 SUBAREA RUNOFF (CFS) = 38.70 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 71 EFFECTIVE AREA(ACRES) = 103.59 AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.71 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD< TOTAL AREA (ACRES) = 103.6 PEAK FLOW RATE (CFS) = 118.03 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH< SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): UNIT-HYDROGRAPH DATA: 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50 RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.02;6H= 2.75;24H= 6.83 S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0% END OF SUBAREA STREET FLOW HYDRAULICS: MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.05 Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.54; Ybar = 0.50 FLOW VELOCITY (FEET/SEC.) = 9.59 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.96 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; AND L = 1082.4 FT WITH ELEVATION-DROP = 75.0 FT, IS 86.2 CFS, 3HR = 1.00; 6HR = 1.00; 24HR = 1.00WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20349.00 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 671.1 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET. LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20349.00 = 6415.39 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Lca/L=0.3, n=.0500; Lca/L=0.4, n=.0448; Lca/L=0.5, n=.0412; Lca/L=0.6, n=.0384 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 1 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 776.51 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< TOTAL PEAK FLOW RATE (CFS) = 776.51 (SOURCE FLOW INCLUDED) RATIONAL METHOD PEAK FLOW RATE (CFS) = 638.07 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES \_\_\_\_\_\_ (UPSTREAM NODE PEAK FLOW RATE (CFS) = 638.07) TOTAL NUMBER OF STREAMS = 2 PEAK FLOW RATE (CFS) USED = 776.51 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* TIME OF CONCENTRATION (MIN.) = 32.65RAINFALL INTENSITY (INCH/HR) = 1.80FLOW PROCESS FROM NODE 20349.00 TO NODE 20350.00 IS CODE = 63 AREA-AVERAGED Fm(INCH/HR) = 0.53AREA-AVERAGED Fp (INCH/HR) = 0.75 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< AREA-AVERAGED Ap = 0.71>>>> (STREET TABLE SECTION # 5 USED) <<<< EFFECTIVE STREAM AREA(ACRES) = 103.59 \_\_\_\_\_\_ TOTAL STREAM AREA(ACRES) = 103.59 UPSTREAM ELEVATION(FEET) = 1785.00 DOWNSTREAM ELEVATION(FEET) = 1715.00 PEAK FLOW RATE (CFS) AT CONFLUENCE = 118.03 STREET LENGTH (FEET) = 1290.16 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE INSIDE STREET CROSSFALL(DECIMAL) = 0.020 1 527.10 36.19 1.693 0.71(0.54)0.76 505.5 20300.00 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 567.5 20320.00 413.39 52.82 1.349 0.71(0.54)0.76 1 118.03 32.65 1.801 0.75(0.53)0.71 103.6 20340.00 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 CONFLUENCE FORMULA USED FOR 2 STREAMS. Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE \*\*\*STREET FLOWING FULL\*\*\* 1 638.07 32.65 1.801 0.71(0.54)0.76 559.6 20340.00 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: 635.07 36.19 1.693 0.71(0.54)0.76 609.1 20300.00 STREET FLOW DEPTH (FEET) = 1.223 489.34 52.82 1.349 0.71(0.54)0.76 671.1 20320.00 HALFSTREET FLOOD WIDTH (FEET) = 53.84 AVERAGE FLOW VELOCITY (FEET/SEC.) = 13.81 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 16.80 PEAK FLOW RATE (CFS) = 638.07 Tc (MIN.) = 32.65STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 37.75 EFFECTIVE AREA(ACRES) = 559.63 AREA-AVERAGED Fm(INCH/HR) = 0.54 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.651

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 40

Page 39

Date: 04/21/2014 File name: LR0203ZZ.RES

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                      STREETFLOW HYDRAULICS BASED ON MAINLINE To :
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                                                                                      STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 124.91
                                         Fρ
                                                   Αp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       ***STREET FLOWING FULL***
RESIDENTIAL
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                          0.75
"3-4 DWELLINGS/ACRE" B 4.52
                                                  0.600
                                                                                       STREET FLOW DEPTH (FEET) = 0.66
RESIDENTIAL
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 25.76
                      B 72.05
                                          0.75
                                                  0.900 56
".4 DWELLING/ACRE"
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.92
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.84
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.882
                                                                                      *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                            AND L = 1290.2 FT WITH ELEVATION-DROP = 70.0 FT, IS 170.7 CFS,
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.02;6H= 2.75;24H= 6.80
                                                                                            WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20350.00
S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
                                                                                    *****************
        MOUNTAIN= 0.0\%; FOOTHILL= 0.0\%; DESERT (UNDEV.) = 0.0\%
                                                                                      FLOW PROCESS FROM NODE 20350.00 TO NODE 20351.00 IS CODE = 63
Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.55; Ybar = 0.52
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                    _____
DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                      >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                                     >>>> (STREET TABLE SECTION # 5 USED) <<<<
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 747.7
                                                                                    ______
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 12513.68 FEET.
                                                                                      UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1680.00
EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                      STREET LENGTH (FEET) = 1342.03 CURB HEIGHT (INCHES) = 6.0
Lca/L=0.3,n=.0530; Lca/L=0.4,n=.0475; Lca/L=0.5,n=.0436; Lca/L=0.6,n=.0407
                                                                                      STREET HALFWIDTH (FEET) = 18.00
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 217.83
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 842.33
                                                                                      DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
TOTAL AREA (ACRES) = 747.7 PEAK FLOW RATE (CFS) = 842.33
                                                                                      INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                      SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                      STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
DEPTH(FEET) = 1.23 HALFSTREET FLOOD WIDTH(FEET) = 54.63
                                                                                      Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
FLOW VELOCITY (FEET/SEC.) = 13.94 DEPTH*VELOCITY (FT*FT/SEC.) = 17.18
                                                                                      MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
                                                                                       ***STREET FLOWING FULL***
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                       STREET FLOW DEPTH(FEET) = 1.43
ESTIMATED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 64.28
ASSUME FULL-FLOWING PIPELINE
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.57
PIPE-FLOW VELOCITY(FEET/SEC.) = 30.33
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 15.06
PIPE-FLOW(CFS) = 721.28
                                                                                      STREET FLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 39.02
PIPEFLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 36.90
                                                                                      * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.618
UNIT-HYDROGRAPH DATA:
                                                                                      SUBAREA LOSS RATE DATA (AMC II):
RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.02;6H= 2.75;24H= 6.80
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                               Fρ
                                                                                                                                                SCS
S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
                                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                      RESIDENTIAL
Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.55; Ybar = 0.52
                                                                                      "3-4 DWELLINGS/ACRE" B 7.14
                                                                                                                                0.75
                                                                                                                                        0.600
                                                                                                                                                 56
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                      RESIDENTIAL
                                                                                                                    72.56 0.75 0.900
                                                                                                                                                 56
DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                      ".4 DWELLING/ACRE"
                                                                                                             В
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.873
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 747.7
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 13803.84 FEET.
                                                                                      UNIT-HYDROGRAPH DATA:
EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                      RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.03;6H= 2.75;24H= 6.77
Lca/L=0.3,n=.0463; Lca/L=0.4,n=.0415; Lca/L=0.5,n=.0381; Lca/L=0.6,n=.0356
                                                                                      S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 217.83
                                                                                              MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
TOTAL AREA (ACRES) = 747.7 PEAK FLOW RATE (CFS) = 846.19
                                                                                      Tc(HR) = 0.65; LAG(HR) = 0.52; Fm(INCH/HR) = 0.56; Ybar = 0.53
                                                                                      USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                      3HR = 0.99; 6HR = 1.00; 24HR = 1.00
```

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 42

Date: 04/21/2014

File name: LR0203ZZ.RES

```
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
                                               827.4
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 13803.84 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0503; Lca/L=0.4, n=.0451; Lca/L=0.5, n=.0414; Lca/L=0.6, n=.0386
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 235.58
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 908.48
 TOTAL AREA (ACRES) = 827.4 PEAK FLOW RATE (CFS) = 908.48
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.44 HALFSTREET FLOOD WIDTH(FEET) = 65.07
 FLOW VELOCITY (FEET/SEC.) = 10.64 DEPTH*VELOCITY (FT*FT/SEC.) = 15.33
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 78.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 23.51
 PIPE-FLOW(CFS) = 780.77
 PIPEFLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 37.85
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.03;6H= 2.75;24H= 6.77
 S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.49; Fm(INCH/HR) = 0.56; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 827.4
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 15145.87 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0435; Lca/L=0.4,n=.0390; Lca/L=0.5,n=.0359; Lca/L=0.6,n=.0335
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 235.58
 TOTAL AREA (ACRES) = 827.4 PEAK FLOW RATE (CFS) = 921.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 140.44
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 31.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.34
******************
 FLOW PROCESS FROM NODE 20351.00 TO NODE 20352.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1680.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 1091.03 CURB HEIGHT (INCHES) = 6.0
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                      928.18
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.49
 HALFSTREET FLOOD WIDTH (FEET) = 67.33
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.16
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 15.10
STREET FLOW TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 39.64
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.603
SUBAREA LOSS RATE DATA (AMC II):
                                       Fp
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                            SCS
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
".4 DWELLING/ACRE" B 15.77 0.75
                                                    0.900
                                                             56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.71 0.75
                                                    0.600
                                                             56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.887
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.03;6H= 2.75;24H= 6.77
S-GRAPH: VALLEY (DEV.)=100.0%; VALLEY (UNDEV.) / DESERT= 0.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.56; Ybar = 0.53
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 15145.87 FEET.
EOUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3, n=.0470; Lca/L=0.4, n=.0421; Lca/L=0.5, n=.0387; Lca/L=0.6, n=.0361
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 239.17
UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 916.92
TOTAL AREA (ACRES) = 843.8
                                    PEAK FLOW RATE (CFS) = 921.22
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 1.48 HALFSTREET FLOOD WIDTH (FEET) = 67.15
FLOW VELOCITY (FEET/SEC.) = 10.13 DEPTH*VELOCITY (FT*FT/SEC.) = 15.03
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
```

File name: LR0203ZZ.RES

Page 44

STREET HALFWIDTH (FEET) = 18.00

Date: 04/21/2014

Date: 04/21/2014 File name: LR0203ZZ.RES Page 43

```
ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.60
 PIPE-FLOW(CFS) = 809.35
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 38.66
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.03;6H= 2.75;24H= 6.77
 S-GRAPH: VALLEY(DEV.)=100.0%; VALLEY(UNDEV.)/DESERT= 0.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.56; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 843.8
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0420; Lca/L=0.4,n=.0377; Lca/L=0.5,n=.0346; Lca/L=0.6,n=.0323
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 239.17
 TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) = 928.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 119.36
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.74
  HALFSTREET FLOOD WIDTH (FEET) = 29.91
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.41
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.73
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE(CFS) = 2592.94 Tc(MIN.) = 38.33
 AREA-AVERAGED Fm (INCH/HR) = 0.59 Ybar = 0.54
 TOTAL AREA(ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
******************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2592.94 Tc (MIN.) = 38.33
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.54
```

```
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 12
>>>>CLEAR MEMORY BANK # 2 <<<<
______
*************************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20352.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1670.00 DOWNSTREAM(FEET) = 1655.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 623.43 CHANNEL SLOPE = 0.0241
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 2592.94
 FLOW VELOCITY (FEET/SEC.) = 30.67 FLOW DEPTH (FEET) = 4.47
 TRAVEL TIME (MIN.) = 0.34 Tc (MIN.) = 38.67
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 38.67
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.627
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                    56
 SCHOOL
                            10.49
                                     0.75
                                            0.600
                     В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.59 0.75 0.600
                                                    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    B 21.45 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.792
 SUBAREA AREA(ACRES) = 33.53
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.92;1H= 1.21;3H= 2.05;6H= 2.87;24H= 7.05
 S-GRAPH: VALLEY (DEV.) = 35.7%; VALLEY (UNDEV.) / DESERT= 64.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.59; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.86; 30M = 0.86; 1HR = 0.86;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3135.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0382; Lca/L=0.4, n=.0343; Lca/L=0.5, n=.0315; Lca/L=0.6, n=.0294
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 883.47
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2598.30
 TOTAL AREA(ACRES) = 3135.5 PEAK FLOW RATE(CFS) = 2598.30
```

TOTAL AREA (ACRES) =

3101.9

Date: 04/21/2014 File name: LR0203ZZ.RES Page 45 Date: 04/21/2014 File name: LR0203ZZ.RES Page 46

```
******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                            FLOW PROCESS FROM NODE 20353.00 TO NODE 20353.00 IS CODE = 81
                                                                           ______
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 11
                                                                           _____
                                                                            MAINLINE Tc (MIN.) = 39.47
                                                                            * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.607
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fp
 ** MAIN STREAM CONFLUENCE DATA **
                                                                               LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PEAK FLOW RATE (CFS) = 2598.30 Tc (MIN.) = 38.67
                                                                            SCHOOL
                                                                                                        20.64
                                                                                                                 0.75
                                                                                                                        0.600
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.54
                                                                            RESIDENTIAL
 TOTAL AREA (ACRES) = 3135.5
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                  B 1.09
                                                                                                                 0.75
                                                                                                                        0.600
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE"
                                                                                                  B 25.75
                                                                                                                 0.75
                                                                                                                        0.900
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                            NATURAL FAIR COVER
 PEAK FLOW RATE (CFS) = 928.70 Tc (MIN.) = 38.66
                                                                            "OPEN BRUSH"
                                                                                                  В
                                                                                                         2.69
                                                                                                                 0.61 1.000
 AREA-AVERAGED Fm (INCH/HR) = 0.56 Ybar = 0.53
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 TOTAL AREA (ACRES) = 843.8
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET.
                                                                            SUBAREA AREA(ACRES) = 50.17
                                                                            UNIT-HYDROGRAPH DATA:
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.05;6H= 2.84;24H= 6.98
 UNIT-HYDROGRAPH DATA:
                                                                            S-GRAPH: VALLEY(DEV.) = 50.0%; VALLEY(UNDEV.) / DESERT = 50.0%
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.05;6H= 2.84;24H= 6.99
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 S-GRAPH: VALLEY (DEV.) = 49.4%; VALLEY (UNDEV.) / DESERT= 50.6%
                                                                            Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.58; Ybar = 0.54
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.58; Ybar = 0.54
                                                                            DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4029.5
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET.
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 3979.3
                                                                            EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
                                                                            Lca/L=0.3,n=.0366; Lca/L=0.4,n=.0329; Lca/L=0.5,n=.0302; Lca/L=0.6,n=.0282
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                            TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1124.14
 Lca/L=0.3, n=.0382; Lca/L=0.4, n=.0343; Lca/L=0.5, n=.0315; Lca/L=0.6, n=.0294
                                                                            UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3202.12
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1111.72
                                                                            TOTAL AREA (ACRES) = 4029.5 PEAK FLOW RATE (CFS) = 3202.12
 PEAK FLOW RATE (CFS) = 3196.90
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 12
______
                                                                           *********************
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                            FLOW PROCESS FROM NODE 20353.00 TO NODE 20376.00 IS CODE = 54
______
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
******************
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20353.00 IS CODE = 54
                                                                           ______
______
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1600.00
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 1369.05 CHANNEL SLOPE = 0.0183
                                                                            CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 ELEVATION DATA: UPSTREAM(FEET) = 1655.00 DOWNSTREAM(FEET) = 1625.00
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 3202.12
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1454.79 CHANNEL SLOPE = 0.0206
                                                                            FLOW VELOCITY (FEET/SEC.) = 29.09 FLOW DEPTH (FEET) = 5.00
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
                                                                            TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 40.25
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
 CHANNEL FLOW THRU SUBAREA(CFS) = 3196.90
 FLOW VELOCITY (FEET/SEC.) = 30.40 FLOW DEPTH (FEET) = 4.85
                                                                          TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 39.47
                                                                            FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET.
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
```

Date: 04/21/2014 File name: LR020377.RFS Page 47 Date: 04/21/2014 File name: LR020377.RFS Page 48

SCS

56

56

56

66

```
MAINLINE Tc (MIN.) = 40.25
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.588
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                      В
                              13.67
                                       0.75
                                               0.250
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.97
                                       0.75
                                               0.600
                                                      56
 RESIDENTIAL
                             5.87 0.75
 ".4 DWELLING/ACRE"
                      В
                                               0.900
                                                     56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.523
 SUBAREA AREA (ACRES) = 39.51
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45:30M= 0.93:1H= 1.22:3H= 2.05:6H= 2.84:24H= 6.98
 S-GRAPH: VALLEY(DEV.) = 50.5%; VALLEY(UNDEV.) / DESERT = 49.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.58; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4069.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0354; Lca/L=0.4,n=.0317; Lca/L=0.5,n=.0291; Lca/L=0.6,n=.0272
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1137.34
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3220.80
 TOTAL AREA (ACRES) = 4069.0
                             PEAK FLOW RATE (CFS) = 3220.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 3220.80 Tc (MIN.) = 40.25
 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.54
 TOTAL AREA(ACRES) = 4069.0
*****************
 FLOW PROCESS FROM NODE 20360.00 TO NODE 20361.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 985.35
 ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2160.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.078
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.270
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                                      SCS Tc
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                              6.63
                                      0.75 0.700 56 12.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 16.39
 TOTAL AREA (ACRES) = 6.63 PEAK FLOW RATE (CFS) = 16.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20361.00 TO NODE 20362.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2130.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.55 CHANNEL SLOPE = 0.0586
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 16.39
 FLOW VELOCITY (FEET/SEC.) = 2.51 FLOW DEPTH (FEET) = 0.36
 TRAVEL TIME (MIN.) = 3.40 Tc (MIN.) = 15.48
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20362.00 = 1496.90 FEET.
*************************
 FLOW PROCESS FROM NODE 20362.00 TO NODE 20362.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 15.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.818
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fр
                                            Ар
                                                    SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            5.52
                                      0.75
                                             0.700
                                                     56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       B 0.40
                                      0.75
                                             0.600
                                                     56
 NATURAL FAIR COVER
                              3.20
 "OPEN BRUSH"
                                      0.61
                                             1.000
                                                     66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                              3.04
                                      0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
                           SUBAREA RUNOFF(CFS) = 25.50
 SUBAREA AREA(ACRES) = 12.16
 EFFECTIVE AREA(ACRES) = 18.79 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 18.8 PEAK FLOW RATE (CFS) = 39.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
FLOW PROCESS FROM NODE 20362.00 TO NODE 20363.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 49 LAND USE

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.244
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2130.00 DOWNSTREAM(FEET) = 2110.00
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                           SCS
 CHANNEL LENGTH THRU SUBAREA (FEET) = 490.89 CHANNEL SLOPE = 0.0407
                                                                            LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 40.000
                                                                         RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "2 DWELLINGS/ACRE"
                                                                                            B 10.47 0.75 0.700
                                                                                                                           56
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             39.19
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 2.94 FLOW DEPTH (FEET) = 0.58
                                                                         "3-4 DWELLINGS/ACRE" B 1.47 0.75 0.600
 TRAVEL TIME (MIN.) = 2.78 Tc (MIN.) = 18.26
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20363.00 = 1987.79 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
                                                                         SUBAREA AREA (ACRES) = 11.94 SUBAREA RUNOFF (CFS) = 18.59
******************
                                                                         EFFECTIVE AREA(ACRES) = 38.25 AREA-AVERAGED Fm(INCH/HR) = 0.51
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20363.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
                                                                         TOTAL AREA(ACRES) = 38.2
............
                                                                                                      PEAK FLOW RATE(CFS) =
                                                                                                                           59.82
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 18.26
                                                                         5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.552
                                                                        *******************
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                  Fρ
                                                                         FLOW PROCESS FROM NODE 20364.00 TO NODE 20365.00 IS CODE = 54
                                                  SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "3-4 DWELLINGS/ACRE"
                   В
                            2.09
                                    0.75
                                            0.600
                                                 56
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 RESIDENTIAL
                                                                        ______
 "2 DWELLINGS/ACRE"
                      В
                            5.13
                                    0.75
                                            0.700
                                                  56
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2090.00
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 586.56 CHANNEL SLOPE = 0.0170
 NATURAL FAIR COVER
                             0.30
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 "OPEN BRUSH"
                      В
                                    0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
                                                                         CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                     59.82
 SUBAREA AREA(ACRES) = 7.52
                            SUBAREA RUNOFF (CFS) = 13.85
                                                                         FLOW VELOCITY (FEET/SEC.) = 2.21 FLOW DEPTH (FEET) = 0.74
                                                                         TRAVEL TIME (MIN.) = 4.42 Tc (MIN.) = 27.05
 EFFECTIVE AREA(ACRES) = 26.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
                                                                         LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20365.00 = 3134.55 FEET.
 TOTAL AREA(ACRES) = 26.3 PEAK FLOW RATE(CFS) =
                                                   48.54
                                                                        ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         FLOW PROCESS FROM NODE 20365.00 TO NODE 20365.00 IS CODE = 81
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20364.00 IS CODE = 54
                                                                         MAINLINE Tc(MIN.) = 27.05
______
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.016
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fρ
                                                                                                                   Дp
                                                                                                                          SCS
______
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2100.00
                                                                         RESIDENTIAL
                                                                                                   0.95
 CHANNEL LENGTH THRU SUBAREA (FEET) = 560.20 CHANNEL SLOPE = 0.0179
                                                                         "3-4 DWELLINGS/ACRE" B
                                                                                                             0.75
                                                                                                                    0.600
                                                                                                                           56
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                         RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "2 DWELLINGS/ACRE"
                                                                                            В 11.94
                                                                                                             0.75
                                                                                                                    0.700
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            48.54
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 2.14 FLOW DEPTH (FEET) = 0.67
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 TRAVEL TIME (MIN.) = 4.37 Tc (MIN.) = 22.63
                                                                         SUBAREA AREA(ACRES) = 12.89 SUBAREA RUNOFF(CFS) = 17.38
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20364.00 = 2547.99 FEET.
                                                                         EFFECTIVE AREA(ACRES) = 51.14 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
******************
                                                                         TOTAL AREA(ACRES) = 51.1 PEAK FLOW RATE(CFS) =
                                                                                                                           69.36
 FLOW PROCESS FROM NODE 20364.00 TO NODE 20364.00 IS CODE = 81
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                        MAINLINE Tc(MIN.) = 22.63
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 51 Date: 04/21/2014 File name: LR0203ZZ.RES Page 52

```
FLOW PROCESS FROM NODE 20365.00 TO NODE 20366.00 IS CODE = 54
                                                                          MAINLINE Tc(MIN.) = 35.54
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.712
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                                                            Fρ
                                                                                                                     αA
                                                                                                                            SCS
______
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 2090.00 DOWNSTREAM(FEET) = 2055.00
                                                                          RESIDENTIAL
                                                                          "2 DWELLINGS/ACRE" B 40.07
                                                                                                              0.75
                                                                                                                      0.700
 CHANNEL LENGTH THRU SUBAREA (FEET) = 592.61 CHANNEL SLOPE = 0.0591
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE" B 4.44 0.75
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                                                                      0.600
                                                                                                                             56
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             69.36
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 3.67 FLOW DEPTH (FEET) = 0.62
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                                                                                                     SUBAREA RUNOFF (CFS) = 47.89
 TRAVEL TIME (MIN.) = 2.69 Tc (MIN.) = 29.74
                                                                          SUBAREA AREA(ACRES) = 44.51
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20366.00 = 3727.16 FEET.
                                                                          EFFECTIVE AREA(ACRES) = 104.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
*****************
                                                                          TOTAL AREA(ACRES) = 104.0
                                                                                                       PEAK FLOW RATE(CFS) =
                                                                                                                          112.20
 FLOW PROCESS FROM NODE 20366.00 TO NODE 20366.00 IS CODE = 81
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                         ******************
 MAINLINE Tc(MIN.) = 29.74
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.905
                                                                          FLOW PROCESS FROM NODE 20367.00 TO NODE 20368.00 IS CODE = 54
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         ______
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Аp
                                                  SCS
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 RESIDENTIAL
                                                                         ______
 "3-4 DWELLINGS/ACRE" B 0.40
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 2040.00 DOWNSTREAM(FEET) = 1970.00
                                     0.75
                                            0.600
                                                   56
 RESIDENTIAL
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 949.68 CHANNEL SLOPE = 0.0737
 "2 DWELLINGS/ACRE"
                    в 7.97
                                     0.75
                                            0.700
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
                                                                          CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                       112.20
 SUBAREA AREA(ACRES) = 8.37 SUBAREA RUNOFF(CFS) = 10.43
                                                                          FLOW VELOCITY (FEET/SEC.) = 4.49 FLOW DEPTH (FEET) = 0.71
 EFFECTIVE AREA(ACRES) = 59.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                          TRAVEL TIME (MIN.) = 3.52 Tc (MIN.) = 39.06
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
                                                                          LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20368.00 = 5507.85 FEET.
 TOTAL AREA (ACRES) = 59.5 PEAK FLOW RATE (CFS) =
                                                   74.65
                                                                         ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          FLOW PROCESS FROM NODE 20368.00 TO NODE 20368.00 IS CODE = 81
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
******************
                                                                         _____
 FLOW PROCESS FROM NODE 20366.00 TO NODE 20367.00 IS CODE = 54
                                                                          MAINLINE Tc(MIN.) = 39.06
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.617
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                                                              Fρ
                                                                                                                      Αp
                                                                                                                            SCS
______
                                                                              LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2040.00
                                                                          RESIDENTIAL
                                                                          "2 DWELLINGS/ACRE"
                                                                                             В 15.48
                                                                                                              0.75
                                                                                                                      0.700
                                                                                                                             56
 CHANNEL LENGTH THRU SUBAREA (FEET) = 831.01 CHANNEL SLOPE = 0.0181
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          RESIDENTIAL.
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
                                                                                              В
                                                                                                    0.21
                                                                                                              0.75 0.900
                                                                          ".4 DWELLING/ACRE"
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              74.65
 FLOW VELOCITY (FEET/SEC.) = 2.39 FLOW DEPTH (FEET) = 0.79
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.703
 TRAVEL TIME (MIN.) = 5.80 Tc (MIN.) = 35.54
                                                                          SUBAREA AREA (ACRES) = 15.69
                                                                                                      SUBAREA RUNOFF (CFS) = 15.41
                                                                          EFFECTIVE AREA(ACRES) = 119.71 AREA-AVERAGED Fm(INCH/HR) = 0.51
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20367.00 = 4558.17 FEET.
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
******************
                                                                          TOTAL AREA(ACRES) = 119.7
                                                                                                       PEAK FLOW RATE(CFS) =
                                                                                                                            118.78
 FLOW PROCESS FROM NODE 20367.00 TO NODE 20367.00 IS CODE = 81
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
_____
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 53 Date: 04/21/2014 File name: LR0203ZZ.RES Page 54

```
******************
                                                                       FLOW PROCESS FROM NODE 20368.00 TO NODE 20369.00 IS CODE = 54
                                                                        MAINLINE Tc (MIN.) = 46.39
_____
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.459
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                   Αp
_____
                                                                           LAND USE
                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1900.00
                                                                        RESIDENTIAL
                                                                        ".4 DWELLING/ACRE" B 9.75
 CHANNEL LENGTH THRU SUBAREA(FEET) = 892.15 CHANNEL SLOPE = 0.0785
                                                                                                            0.75
                                                                                                                   0.900
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                        RESIDENTIAL
                                                                        "3-4 DWELLINGS/ACRE" B 0.37
                                                                                                            0.75
                                                                                                                   0.600
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 118.78
                                                                        RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 4.66 FLOW DEPTH (FEET) = 0.71
                                                                        "2 DWELLINGS/ACRE"
                                                                                           B
                                                                                                  7.31
                                                                                                            0.75 0.700
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TRAVEL TIME (MIN.) = 3.19 Tc (MIN.) = 42.25
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20369.00 = 6400.00 FEET.
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810
                                                                        SUBAREA AREA(ACRES) = 17.43
                                                                                                   SUBAREA RUNOFF(CFS) = 13.38
*****************
                                                                        EFFECTIVE AREA(ACRES) = 166.84 AREA-AVERAGED Fm(INCH/HR) = 0.53
 FLOW PROCESS FROM NODE 20369.00 TO NODE 20369.00 IS CODE = 81
                                                                        AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
                                                                        TOTAL AREA(ACRES) = 166.8
                                                                                                     PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 42.25
                                                                         5M = 0.46; 30M = 0.94; 1HR = 1.24; 3HR = 2.02; 6HR = 2.75; 24HR = 5.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.543
                                                                       SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Дp
                                                 SCS
                                                                         FLOW PROCESS FROM NODE 20370.00 TO NODE 20371.00 IS CODE = 63
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                       ______
 RESIDENTIAL
                                                                        >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 "2 DWELLINGS/ACRE" B 29.59
                                           0.700
                                    0.75
                                                                        >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                       _____
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.11 0.75 0.900 56
                                                                        UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1845.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        STREET LENGTH (FEET) = 771.36 CURB HEIGHT (INCHES) = 6.0
                                                                        STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
 SUBAREA AREA(ACRES) = 29.70
                            SUBAREA RUNOFF (CFS) = 27.23
 EFFECTIVE AREA(ACRES) = 149.41 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                        DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
                                                                        INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 149.4 PEAK FLOW RATE (CFS) = 137.98
                                                                        OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                        SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.88; 1HR = 1.16; 3HR = 1.97; 6HR = 2.75; 24HR = 6.42
                                                                         STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                        Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
*********************
                                                                        Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20369.00 TO NODE 20370.00 IS CODE = 54
                                                                        MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 142.35
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          ***STREET FLOWING FULL***
______
                                                                          STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1860.00
                                                                          STREET FLOW DEPTH (FEET) = 0.80
 CHANNEL LENGTH THRU SUBAREA (FEET) = 949.40 CHANNEL SLOPE = 0.0421
                                                                          HALFSTREET FLOOD WIDTH (FEET) = 33.09
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.29
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                          PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.04
 CHANNEL FLOW THRU SUBAREA(CFS) = 137.98
                                                                        STREET FLOW TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 48.44
 FLOW VELOCITY (FEET/SEC.) = 3.82 FLOW DEPTH (FEET) = 0.85
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.421
 TRAVEL TIME (MIN.) = 4.14 Tc (MIN.) = 46.39
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20370.00 = 7349.40 FEET.
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LAND USE
RESIDENTIAL
                                                                        "3-4 DWELLINGS/ACRE" B 1.23
                                                                                                            0.75
                                                                                                                   0.600
 FLOW PROCESS FROM NODE 20370.00 TO NODE 20370.00 IS CODE = 81
                                                                        RESIDENTIAL.
                                                                         ".4 DWELLING/ACRE" B
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                                    0.24
                                                                                                            0.75
                                                                                                                   0.900
```

Page 55

Date: 04/21/2014

File name: LR0203ZZ.RES

Date: 04/21/2014 File name: LR0203ZZ.RES Page 56

56

56

140.04

56

```
RESIDENTIAL
                                                                                     AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 "2 DWELLINGS/ACRE"
                    B 4.18 0.75 0.700 56
                                                                                     TOTAL AREA (ACRES) = 211.6 PEAK FLOW RATE (CFS) = 166.88
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 5.65 SUBAREA RUNOFF (CFS) = 4.62
                                                                                     5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50
 EFFECTIVE AREA(ACRES) = 172.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 172.5
                                 PEAK FLOW RATE (CFS) = 140.04
                                                                                     DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                     FLOW VELOCITY (FEET/SEC.) = 8.11 DEPTH*VELOCITY (FT*FT/SEC.) = 6.24
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.90
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 FLOW VELOCITY (FEET/SEC.) = 6.26 DEPTH*VELOCITY (FT*FT/SEC.) = 4.99
                                                                                     ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20371.00 = 8120.76 FEET.
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 12.31
                                                                                                        38.71
                                                                                     PIPE-FLOW(CFS) =
******************
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 49.22
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.408
 FLOW PROCESS FROM NODE 20371.00 TO NODE 20372.00 IS CODE = 63
                                                                                     SUBAREA AREA (ACRES) = 39.11 SUBAREA RUNOFF (CFS) = 31.32
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                     TOTAL AREA (ACRES) = 211.6 PEAK FLOW RATE (CFS) = 168.27
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 UPSTREAM ELEVATION(FEET) = 1845.00 DOWNSTREAM ELEVATION(FEET) = 1825.00
                                                                                     5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50
 STREET LENGTH (FEET) = 580.50 CURB HEIGHT (INCHES) = 6.0
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HALFWIDTH (FEET) = 18.00
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 129.56
                                                                                      ***STREET FLOWING FULL***
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      STREET FLOW DEPTH(FEET) = 0.71
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 28.51
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.63
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.42
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20372.00 = 8701.26 FEET.
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   *************************
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                     FLOW PROCESS FROM NODE 20372.00 TO NODE 20373.00 IS CODE = 63
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 155.58
                                                                                     >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
   ***STREET FLOWING FULL***
                                                                                    >>>> (STREET TABLE SECTION # 18 USED) <<<<
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   ______
   STREET FLOW DEPTH(FEET) = 0.75
                                                                                     UPSTREAM ELEVATION(FEET) = 1825.00 DOWNSTREAM ELEVATION(FEET) = 1770.00
                                                                                     STREET LENGTH (FEET) = 1298.78 CURB HEIGHT (INCHES) = 8.0
   HALFSTREET FLOOD WIDTH (FEET) = 30.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.97
                                                                                     STREET HALFWIDTH (FEET) = 26.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 49.65
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.400
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                   Aр
                                                          SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 RESIDENTIAL
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE" B 3.05
                                          0.75
                                                   0.600 56
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 RESIDENTIAL
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                 0.700 56
 "2 DWELLINGS/ACRE"
                       в 36.06
                                       0.75
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
                                                                                       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SUBAREA AREA (ACRES) = 39.11 SUBAREA RUNOFF (CFS) = 31.07
                                                                                       ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 211.60 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 57

File name: LR0203ZZ.RES

Date: 04/21/2014

```
STREET FLOW DEPTH (FEET) = 0.82
 HALFSTREET FLOOD WIDTH (FEET) = 33.63
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.85
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.25
STREET FLOW TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 51.67
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.367
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                          Fρ
                                                    Αp
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 6.56
                                                   0.600
                                                          56
                                          0.75
RESIDENTIAL
                      в 75.29
".4 DWELLING/ACRE"
                                          0.75
                                                   0.900
RESIDENTIAL
"2 DWELLINGS/ACRE" B 9.91
                                          0.75 0.700 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
SUBAREA AREA (ACRES) = 91.76 SUBAREA RUNOFF (CFS) = 59.98
EFFECTIVE AREA(ACRES) = 303.36 AREA-AVERAGED Fm(INCH/HR) = 0.56
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
TOTAL AREA (ACRES) = 303.4 PEAK FLOW RATE (CFS) = 220.56
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.94; 1HR = 1.24; 3HR = 2.02; 6HR = 2.75; 24HR = 6.09
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 34.91
FLOW VELOCITY (FEET/SEC.) = 9.13 DEPTH*VELOCITY (FT*FT/SEC.) = 7.72
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 15.84
PIPE-FLOW(CFS) = 77.81
PIPEFLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 50.59
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.385
SUBAREA AREA (ACRES) = 91.76 SUBAREA RUNOFF (CFS) = 61.42
TOTAL AREA (ACRES) = 303.4 PEAK FLOW RATE (CFS) = 225.32
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.94; 1HR = 1.24; 3HR = 2.02; 6HR = 2.75; 24HR = 6.09
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 147.50
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.76
 HALFSTREET FLOOD WIDTH (FEET) = 30.45
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.05
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.08
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1298.8 FT WITH ELEVATION-DROP = 55.0 FT, IS 198.1 CFS,
      WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20373.00
LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20373.00 = 10000.04 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1720.00
 STREET LENGTH (FEET) = 1333.48 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                      250.24
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 37.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.10
 STREET FLOW TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 53.04
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.346
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                    αA
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.64
                                           0.75
                                                    0.600
                                                            56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                        B 73.46 0.75 0.900
                                                            56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.875
 SUBAREA AREA(ACRES) = 80.10 SUBAREA RUNOFF(CFS) = 49.84
 EFFECTIVE AREA(ACRES) = 383.46 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 383.5 PEAK FLOW RATE (CFS) = 264.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.24
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.91 HALFSTREET FLOOD WIDTH(FEET) = 38.08
 FLOW VELOCITY (FEET/SEC.) = 9.19 DEPTH*VELOCITY (FT*FT/SEC.) = 8.35
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 16.83
 PIPE-FLOW(CFS) = 119.07
 PIPEFLOW TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 51.91
```

File name: LR0203ZZ.RES

Page 60

Date: 04/21/2014

FLOW PROCESS FROM NODE 20373.00 TO NODE 20374.00 IS CODE = 63

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.363
 SUBAREA AREA(ACRES) = 80.10 SUBAREA RUNOFF(CFS) = 51.10
 TOTAL AREA (ACRES) = 383.5 PEAK FLOW RATE (CFS) = 270.62
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.24
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 151.55
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.82
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 6.04
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1333.5 FT WITH ELEVATION-DROP = 50.0 FT, IS 167.4 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20374.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20374.00 = 11333.52 FEET.
*******************
 FLOW PROCESS FROM NODE 20374.00 TO NODE 20375.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1660.00
 STREET LENGTH (FEET) = 1282.17 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.75
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 294.81
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.91
   HALFSTREET FLOOD WIDTH (FEET) = 38.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.32
 STREET FLOW TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 53.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.332
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                        Fρ
                                                 αA
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.27
                                         0.75
                                                 0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 70.54
                                         0.75
                                                 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.869
 SUBAREA AREA(ACRES) = 78.81
                               SUBAREA RUNOFF(CFS) = 48.38
```

```
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 462.3 PEAK FLOW RATE (CFS) =
                                                         308.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.45
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 38.63
 FLOW VELOCITY (FEET/SEC.) = 10.40 DEPTH*VELOCITY (FT*FT/SEC.) = 9.56
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.75
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.83
 PIPE-FLOW(CFS) = 164.67
 PIPEFLOW TRAVEL TIME (MIN.) = 1.08 Tc (MIN.) = 52.99
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.347
 SUBAREA AREA (ACRES) = 78.81 SUBAREA RUNOFF (CFS) = 49.44
 TOTAL AREA(ACRES) = 462.3
                                  PEAK FLOW RATE (CFS) = 314.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.45
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 149.62
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.26
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1282.2 FT WITH ELEVATION-DROP = 60.0 FT, IS 172.8 CFS,
        WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20375.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20375.00 = 12615.69 FEET.
*******************
 FLOW PROCESS FROM NODE 20375.00 TO NODE 20376.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1660.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1887.14 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 36.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 25.41
 PIPE-FLOW(CFS) = 314.30
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 54.31
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.327
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                           SCS
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 62

EFFECTIVE AREA(ACRES) = 462.27 AREA-AVERAGED Fm(INCH/HR) = 0.59

```
LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.76
                                        0.75
                                                0.600
                                                      56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                           79.51
                                        0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845
 SUBAREA AREA (ACRES) = 97.27
                               SUBAREA RUNOFF (CFS) = 60.82
 EFFECTIVE AREA(ACRES) = 559.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 559.5
                              PEAK FLOW RATE(CFS) =
                                                        366.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 52.61
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.59
   HALFSTREET FLOOD WIDTH (FEET) = 21.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.17
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 1887.1 FT WITH ELEVATION-DROP = 60.0 FT, IS 179.7 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20376.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20376.00 = 14502.83 FEET.
FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 54.31
 RAINFALL INTENSITY (INCH/HR) = 1.33
 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.80
 EFFECTIVE STREAM AREA(ACRES) = 559.54
 TOTAL STREAM AREA(ACRES) = 559.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 366.91
 ** CONFLUENCE DATA **
 STREAM
         0
                 Tc
                         AREA
                                HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                 NODE
   1
         3220.80 40.25 4068.99 20120.00
          366.91 54.31 559.54 20360.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.83;24H= 6.90
 S-GRAPH: VALLEY(DEV.) = 56.5%; VALLEY(UNDEV.) / DESERT = 43.5%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.58; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0354; Lca/L=0.4,n=.0317; Lca/L=0.5,n=.0291; Lca/L=0.6,n=.0272
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1261.05
 PEAK FLOW RATE (CFS) = 3578.84
************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 4628.5 TC (MIN.) =
                                        40.25
 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.54
 PEAK FLOW RATE (CFS) = 3578.84
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Page 63 Date: 04/21/2014 File name: LR0203ZZ.RES Page 64

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20454

FILE NAME: LR0204ZZ.DAT

TIME/DATE OF STUDY: 13:57 10/16/2013

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====		==========	=====	=====	=====	=====	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

19	26.0 52.0	10.0 ( 15.0 ( 20.0 (	0.020/0.020/0 0.020/0.020/0 0.020/0.020/0	0.020 0.020 0.020	0.50 0.67 0.67	1.50 2.00 2.00	0.0312 0.0312 0.0312	0.125 0.167 0.167	0.0180 0.0180 0.0180
1 *SI OF	l. Relativ as (Maz 2. (Depth) IZE PIPE V R EQUAL TO	ve Flow-Depkimum Allow * (Velocity VITH A FLOW O THE UPSTE	PTH CONSTRAIN oth = 0.20 Nable Street y) Constrain CAPACITY GREAM TRIBUTAL UM TOPOGRAPH.	FEET  Flow De  t = 6.0  REATER T  RY PIPE.	) (FT*FT THAN .*	/S)			
			SELECTIONS/	PARAMETE	ERS:				
M		LAG = 0.80 GRAPH TYPE		DEI	RCENTAGE	(DECT	Μ <b>2</b> λ Τ. )		
	VALLI FOOTI MOUNT VALLI	EY (DEVELOPI HILL FAIN EY (UNDEVELO	ED) OPED)/DESERT		1.000 0.000 0.000		.IA.L.)		
	DESE	RT (UNDEVELO	OPED)		0.000				
			ENTERED ON S		BASIS.				
			AREA FACTORS						
*AN'I	recedent i	MOISTURE CO	ONDITION (AM	C) II AS	SSUMED F	OR UN.	IT HYDRO	GRAPH	METHOD*
INI ELE Tc	EVATION DA	AREA FLOW-1 ATA: UPSTRE	RATION NOMOGI LENGTH (FEET) EAM (FEET) =	======================================	1.07 00 DOWN	===== STREAI 0	======	= 16	====== 70.00
		RAINFALL IN	MINIMUM Tc() NTENSITY(INC) ATE DATA(AMC	H/HR) = II):	3.397				
		AND LOSS RA							
SUE	BAREA To A EVELOPMENT LAND US	T TYPE/ SE	SCS SOIL GROUP	AREA (ACRES)	(INCH/	HR)	Ap (DECIMAI	SCS L) CN	Tc (MIN.)
SUE DE RES	BAREA TC A EVELOPMENT LAND US SIDENTIAL 1 DWELLING	T TYPE/ SE G/ACRE"	SCS SOIL GROUP B	(ACRES)	(INCH/	HR)	(DECIMAI	L) CN	(MIN.)
RESULT SUE	BAREA TO A EVELOPMENT LAND US BIDENTIAL DWELLING BIDENTIAL DWELLING BAREA AVEI BAREA AVEI BAREA AVEI	I TYPE/ SE G/ACRE" NGS/ACRE" RAGE PERVIO RAGE PERVIO	GROUP  B  B  DUS LOSS RATION  DUS AREA FRAGO	(ACRES) 0.14 10.27 E, Fp(IN	(INCH/ 0.  0.  NCH/HR)	HR) 75 75 = 0.	0.900 0.600	L) CN 56	(MIN.)
RES ".4 RES SUE SUE SUE	BAREA TO A EVELOPMENT LAND US BIDENTIAL DWELLING BIDENTIAL A DWELLING BAREA AVER BAREA RUNG BAREA RUNG	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIC  RAGE PERVIC  DFF(CFS) =	GROUP  B  B  DUS LOSS RATION  DUS AREA FRAG  27.59	0.14 10.27 E, Fp(IN	(INCH/  0.  0.  NCH/HR)  Ap = 0.	HR) 75 75 = 0.7 604	0.900 0.600 75	56 56	(MIN.)
RES ".4 RES SUE SUE SUE	BAREA TO A EVELOPMENT LAND US BIDENTIAL DWELLING BIDENTIAL A DWELLING BAREA AVER BAREA RUNG BAREA RUNG	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIC  RAGE PERVIC  DFF(CFS) =	GROUP  B  B  DUS LOSS RATION  DUS AREA FRAGO	0.14 10.27 E, Fp(IN	(INCH/  0.  0.  NCH/HR)  Ap = 0.	HR) 75 75 = 0.7 604	0.900 0.600 75	56 56	(MIN.)
RES ".4 RES "3- SUE SUE TOT	BAREA TO A EVELOPMENT LAND US SIDENTIAL DWELLING SIDENTIAL A DWELLING BAREA AVEN BAREA AVEN BAREA RUNG FAL AREA (A	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIO  RAGE PERVIO  DFF(CFS) =  ACRES) =	GROUP  B  B  DUS LOSS RATION  DUS AREA FRAG  27.59	(ACRES)  0.14  10.27 E, Fp(IN CTION, F EAK FLOW	(INCH/  0.  0.  ICH/HR)  Ap = 0.  V RATE(C	HR) 75 75 = 0.7 604 FS) =	0.900 0.600 75	56 56 56	(MIN.) 13.40 11.34
RES ".4 RES SUE SUE SUE SUE SUE SUE SUE SUE SUE S	BAREA TO A EVELOPMENT LAND US EIDENTIAL I DWELLING SIDENTIAL A DWELLING BAREA AVEN BAREA AVEN BAREA AVEN BAREA AVEN BAREA AVEN BAREA AREA BAREA RUNG FAL AREA (A BAREA AREA BAREA BAREA BAREA AREA BAREA BAR	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIC  RAGE PERVIC  DFF(CFS) =  A-CRES) =  A-AVERAGED  30M = 0.95;	GROUP  B  B  DUS LOSS RATH  27.59  10.41  PI  RAINFALL DES	(ACRES) 0.14 10.27 E, Fp(IN CTION, F EAK FLOW PTH(INCF; 3HR =	(INCH/  0.  0. ICH/HR) Ap = 0. V RATE(C  i): 2.03; 6	HR) 75 75 = 0.7 6004 FS) = HR = 2	0.900 0.600 75 27,	56 56 56 59 HHR = 5	(MIN.) 13.40 11.34
RES ".4 RES SUE SUE TOT SUE 5M FLC	BAREA TO A EVELOPMENT LAND US EIDENTIAL DWELLING BIDENTIAL DWELLING BAREA AVEN BAREA AVEN BAREA AVEN BAREA AREA E 0.46; WWELLING WWELLING BAREA AREA BAREA AREA BAREA AREA BAREA AREA BAREA AREA WWELLING BAREA AREA BAREA AREA BAREA AREA BAREA AREA WWELLING BAREA AREA BAREA AREA BAREA AREA WWELLING BAREA AREA BAREA AREA BAREA AREA WWELLING BAREA AREA BAREA AREA WWELLING WW	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIOUS PE	GROUP  B  B  DUS LOSS RATH  DUS AREA FRAG  27.59  10.41 PH  RAINFALL DE: ; 1HR = 1.25	(ACRES)  0.14  10.27 E, Fp(IN CTION, F  EAK FLOW PTH(INCF ; 3HR =  ******** TO NODE IME THRU	(INCH/  0.  0.  ICH/HR)  Ap = 0.  W RATE (C  H): 2.03; 6  ********  20402.  J SUBARE	HR) 75 75 = 0.7 604 FS) = HR = 2 ******	0.900 0.600 75 27. 2.75; 24 ************************************	56 56 56 59 HHR = 5	(MIN.) 13.40 11.34
RES ".4 RES SUE SUE TOT SUE 5M FLC	BAREA TO A EVELOPMENT LAND US SIDENTIAL DWELLING SIDENTIAL DWELLING BAREA AVEN BAREA AVEN BAREA AVEN BAREA AREA CAL AREA (A BAREA AREA BO .46; (5) ********** DW PROCESS >>> COMPUTE >>> (STREET ==================================	T TYPE/ SE  G/ACRE"  NGS/ACRE"  RAGE PERVIC  RAGE PERVIC  OFF(CFS) =  A-AVERAGED  BOM = 0.95;  *************  S FROM NODE  E STREET FI  T TABLE SEC	GROUP  B  B  DUS LOSS RATH  DUS AREA FRA  27.59  10.41 PI  RAINFALL DES  1HR = 1.25  ***********************************	(ACRES)  0.14  10.27 E, FP(INCTION, F  EAK FLOW  PTH(INCH ; 3HR =  *******  TO NODE  IME THRU SED) <<<<========	(INCH/  0.  0.  ICH/HR)  Ap = 0.  W RATE (C  1): 2.03; 6  ******* 20402.  J SUBARE  <	HR) 75 75 = 0.7 604 FS) = HR = 2 ***** 00 IS A<<<<	0.900 0.600 75 27. 2.75; 24	56 56 56 56 56 56 56 56 59 59 57 57 57 57 57 57 57 57 57 57 57 57 57	(MIN. 13.4 11.3 11.3 11.3 11.3 11.3 11.3 11.

Date: 04/21/2014 File name: LR0204ZZ.RES Page 1 Date: 04/21/2014 File name: LR0204ZZ.RES Page 2

```
UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1657.00
 STREET LENGTH (FEET) = 293.15 CURB HEIGHT (INCHES) = 6.0
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.64
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 25.21
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.72
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.80
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 13.08
   ***STREET FLOWING FULL***
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.118
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.62
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 2.76 0.75 0.600 56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.75
 STREET FLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 12.21
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.250
                                                                                  SUBAREA AREA (ACRES) = 2.76 SUBAREA RUNOFF (CFS) = 6.63
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  EFFECTIVE AREA(ACRES) = 21.71 AREA-AVERAGED Fm(INCH/HR) = 0.45
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                                  TOTAL AREA (ACRES) = 21.7 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.06 0.75
                                                 0.900 56
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.48 0.75 0.600 56
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.602
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 8.54 SUBAREA RUNOFF (CFS) = 21.51
                                                                                  DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.46
 EFFECTIVE AREA(ACRES) = 18.95 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.80 DEPTH*VELOCITY (FT*FT/SEC.) = 2.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                                  LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20403.00 = 1415.72 FEET.
 TOTAL AREA (ACRES) = 19.0 PEAK FLOW RATE (CFS) = 47.73
                                                                                ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW PROCESS FROM NODE 20403.00 TO NODE 20404.00 IS CODE = 63
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                ______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 18.81
                                                                                ______
 FLOW VELOCITY (FEET/SEC.) = 6.11 DEPTH*VELOCITY (FT*FT/SEC.) = 3.16
                                                                                  UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1645.00
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20402.00 = 1217.22 FEET.
                                                                                  STREET LENGTH(FEET) = 470.13 CURB HEIGHT(INCHES) = 6.0
                                                                                  STREET HALFWIDTH (FEET) = 18.00
********************
 FLOW PROCESS FROM NODE 20402.00 TO NODE 20403.00 IS CODE = 63
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1657.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 198.50 CURB HEIGHT (INCHES) = 6.0
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
```

52.11

61.52

Date: 04/21/2014 File name: LR0204ZZ.RES Date: 04/21/2014 File name: LR0204ZZ.RES Page 3 Page 4

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.22
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.19
 STREET FLOW TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 14.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.921
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.38 0.75
                                               0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.08 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 8.46 SUBAREA RUNOFF (CFS) = 18.81
 EFFECTIVE AREA(ACRES) = 30.17 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 30.2
                                PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.30
 FLOW VELOCITY (FEET/SEC.) = 5.35 DEPTH*VELOCITY (FT*FT/SEC.) = 3.35
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20404.00 = 1885.85 FEET.
FLOW PROCESS FROM NODE 20404.00 TO NODE 20405.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1645.00 DOWNSTREAM ELEVATION(FEET) = 1635.00
 STREET LENGTH (FEET) = 344.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.89
 STREET FLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 15.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.816
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  Αp
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" B 9.77 0.75 0.600
 RESIDENTIAL
                      B 0.09 0.75 0.900
 ".4 DWELLING/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 9.86 SUBAREA RUNOFF (CFS) = 20.99
 EFFECTIVE AREA(ACRES) = 40.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 40.0 PEAK FLOW RATE (CFS) =
                                                          85.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46: 30M = 0.95: 1HR = 1.25: 3HR = 2.03: 6HR = 2.75: 24HR = 5.56
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.09
 FLOW VELOCITY (FEET/SEC.) = 6.39 DEPTH*VELOCITY (FT*FT/SEC.) = 4.10
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20405.00 = 2230.11 FEET.
******************
 FLOW PROCESS FROM NODE 20405.00 TO NODE 20406.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1635.00 DOWNSTREAM ELEVATION(FEET) = 1620.00
 STREET LENGTH (FEET) = 701.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 104.71
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 STREET FLOW TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 17.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.615
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Aр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 20.00 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 6

```
SUBAREA AREA(ACRES) = 20.00 SUBAREA RUNOFF(CFS) = 38.99
 EFFECTIVE AREA(ACRES) = 60.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 60.0 PEAK FLOW RATE (CFS) = 116.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.55
 FLOW VELOCITY(FEET/SEC.) = 5.94 DEPTH*VELOCITY(FT*FT/SEC.) = 4.62
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20406.00 = 2931.13 FEET.
******************
 FLOW PROCESS FROM NODE 20406.00 TO NODE 20407.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1620.00 DOWNSTREAM ELEVATION(FEET) = 1612.00
 STREET LENGTH (FEET) = 570.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.02
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.77
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.84
   HALFSTREET FLOOD WIDTH (FEET) = 34.42
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 STREET FLOW TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 19.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.464
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.31 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.31 SUBAREA RUNOFF (CFS) = 9.63
 EFFECTIVE AREA(ACRES) = 65.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 65.3 PEAK FLOW RATE (CFS) = 118.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 7

```
FLOW VELOCITY (FEET/SEC.) = 5.15 DEPTH*VELOCITY (FT*FT/SEC.) = 4.27
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20407.00 = 3501.13 FEET.
*********************
 FLOW PROCESS FROM NODE 20407.00 TO NODE 20408.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1612.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 804.76 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 31.98
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.81
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.35
 STREET FLOW TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 21.34
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.324
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 22.89 0.75 0.600
                       В
                              0.02 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 22.91 SUBAREA RUNOFF(CFS) = 38.68
 EFFECTIVE AREA(ACRES) = 88.25 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 88.2 PEAK FLOW RATE(CFS) = 148.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.89
 FLOW VELOCITY (FEET/SEC.) = 6.95 DEPTH*VELOCITY (FT*FT/SEC.) = 5.59
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20408.00 = 4305.89 FEET.
FLOW PROCESS FROM NODE 20408.00 TO NODE 20409.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 34.05

```
TOTAL AREA (ACRES) = 144.2 PEAK FLOW RATE (CFS) =
                                                      240.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 142.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.82
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.90
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 498.4 FT WITH ELEVATION-DROP = 20.0 FT, IS 208.3 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20409.00
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20409.00 = 4804.31 FEET.
******************
 FLOW PROCESS FROM NODE 20409.00 TO NODE 20410.00 IS CODE = 63
_______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1533.00
 STREET LENGTH (FEET) = 1374.92 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.97
   HALFSTREET FLOOD WIDTH (FEET) = 41.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.05
 STREET FLOW TRAVEL TIME (MIN.) = 2.77 Tc (MIN.) = 24.61
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.134
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                                         0.61 1.000
 "OPEN BRUSH"
                      B 0.01
                                                         66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 52.45 0.75 0.600
                                                         56
 PUBLIC PARK
                        В
                              0.03
                                         0.75
                                                 0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 52.49 SUBAREA RUNOFF (CFS) = 79.60
 EFFECTIVE AREA(ACRES) = 196.68 AREA-AVERAGED Fm(INCH/HR) = 0.44
```

File name: LR0204ZZ.RES

Page 10

Date: 04/21/2014

SUBAREA AREA(ACRES) = 55.94 SUBAREA RUNOFF(CFS) = 94.09

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 196.7 PEAK FLOW RATE (CFS) =
                                                     299.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 42.29
 FLOW VELOCITY (FEET/SEC.) = 8.42 DEPTH*VELOCITY (FT*FT/SEC.) = 8.36
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 39.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.04
 PIPE-FLOW(CFS) = 124.88
 PIPEFLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 23.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.201
 SUBAREA AREA (ACRES) = 52.49 SUBAREA RUNOFF (CFS) = 82.78
 TOTAL AREA (ACRES) = 196.7 PEAK FLOW RATE (CFS) = 311.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 186.53
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.41
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.37
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
*****
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3578.84 Tc (MIN.) = 40.25
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.54
 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
```

```
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3578.84 Tc (MIN.) = 40.25
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.54
 TOTAL AREA(ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20410.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1533.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2846.26 CHANNEL SLOPE = 0.0235
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 3578.84
 FLOW VELOCITY (FEET/SEC.) = 32.88 FLOW DEPTH (FEET) = 4.96
 TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 41.69
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 41.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.555
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    в 25.52 0.75
                                            0.600
                                                   56
 PUBLIC PARK
                           5.30 0.75
                                            0.850 56
 SCHOOL
                      В
                           8.19
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA (ACRES) = 39.01
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.83;24H= 6.89
 S-GRAPH: VALLEY(DEV.) = 56.8%; VALLEY(UNDEV.) / DESERT= 43.2%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.56; Fm(INCH/HR) = 0.58; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0330; Lca/L=0.4, n=.0296; Lca/L=0.5, n=.0272; Lca/L=0.6, n=.0254
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1271.39
```

Date: 04/21/2014 File name: LR0204ZZ.RES Page 11 Date: 04/21/2014 File name: LR0204ZZ.RES Page 12

```
UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3534.71
 TOTAL AREA(ACRES) = 4667.5
                              PEAK FLOW RATE (CFS) = 3578.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.00
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE(CFS) = 3578.84
                              Tc(MIN.) = 41.69
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.54
 TOTAL AREA (ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
           0
                  Tc Intensity Fp(Fm)
                                       Ap Ae HEADWATER
  STREAM
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
          311.41 23.37 2.201 0.75(0.44) 0.59 196.7 20400.00
    1
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.82;24H= 6.84
 S-GRAPH: VALLEY (DEV.) = 58.6%; VALLEY (UNDEV.) / DESERT= 41.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.56; Fm(INCH/HR) = 0.58; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.79; 30M = 0.79; 1HR = 0.79;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4864.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0330; Lca/L=0.4,n=.0296; Lca/L=0.5,n=.0272; Lca/L=0.6,n=.0254
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1322.20
 PEAK FLOW RATE (CFS) = 3684.37
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20452.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1533.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1329.02 CHANNEL SLOPE = 0.0173
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
```

```
FLOW VELOCITY (FEET/SEC.) = 29.63 FLOW DEPTH (FEET) = 5.44
 TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 42.44
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
********************
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 42.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.539
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fp
                                                    SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 25.77
                                      0.75
                                             0.600
                                                    56
 PUBLIC PARK
                      В
                            1.54
                                      0.75
                                             0.850
                                                    56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                            0.79
                                      0.61 1.000
                                                     66
 COMMERCIAL
                       В
                             0.05
                                      0.75
                                             0.100
                                                    56
                      В
                              5.02
                                      0.75
                                             0.250
                                                    56
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.567
 SUBAREA AREA(ACRES) = 33.17
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.82;24H= 6.83
 S-GRAPH: VALLEY (DEV.) = 58.9%; VALLEY (UNDEV.) / DESERT= 41.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.58; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.79; 30M = 0.79; 1HR = 0.79;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4897.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0321; Lca/L=0.4,n=.0288; Lca/L=0.5,n=.0265; Lca/L=0.6,n=.0247
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1330.84
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3656.32
 TOTAL AREA(ACRES) = 4897.4
                               PEAK FLOW RATE (CFS) = 3684.37
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
._____
******************
 FLOW PROCESS FROM NODE 20420.00 TO NODE 20421.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 575.26
 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1735.00
```

File name: LR020477.RFS

Page 14

Date: 04/21/2014

Date: 04/21/2014 File name: LR0204ZZ.RES Page 13

CHANNEL FLOW THRU SUBAREA(CFS) = 3684.37

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.027
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.454
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                Ap SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                               0.69
                                        0.98
                                                0.600 32 13.52
 MOBILE HOME PARK
                      A
                             4.22
                                     0.98 0.250 32 11.03
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.299
 SUBAREA RUNOFF (CFS) = 13.97
 TOTAL AREA(ACRES) = 4.91 PEAK FLOW RATE(CFS) =
                                                13.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 20421.00 TO NODE 20422.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1735.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1725.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 643.67
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.060
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                0.250 32
 MOBILE HOME PARK
                     A
                              2.50
                                        0.98
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.99
                                        0.98
                                                0.600 32
 COMMERCIAL
                      A 2.87
                                        0.98
                                                0.100 32
                       В
 COMMERCIAL
                               1.82
                                        0.75
                                                0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.05
                                        0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.285
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.87
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.35
 AVERAGE FLOW DEPTH(FEET) = 0.63 FLOOD WIDTH(FEET) = 36.08
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.46 Tc (MIN.) = 13.49
 SUBAREA AREA (ACRES) = 10.23 SUBAREA RUNOFF (CFS) = 25.90
 EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.29
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                         38.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.68 FLOOD WIDTH (FEET) = 42.36
 FLOW VELOCITY (FEET/SEC.) = 4.62 DEPTH*VELOCITY (FT*FT/SEC) = 3.16
```

```
******************
 FLOW PROCESS FROM NODE 20422.00 TO NODE 20423.00 IS CODE = 63
-----
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1725.00 DOWNSTREAM ELEVATION(FEET) = 1712.00
 STREET LENGTH (FEET) = 299.17 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 47.48
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.55
  HALFSTREET FLOOD WIDTH (FEET) = 19.62
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.88
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.24
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc(MIN.) = 14.34
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.950
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                    A
                            2.62 0.98 0.250
                                                     32
                            0.15 0.98
                                              0.600
                                                     32
 SCHOOL
                     A
 COMMERCIAL
                     A
                           1.21
                                       0.98
                                              0.100
                                                      32
                     B 2.01
                                       0.75
                                              0.100
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.63
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
 SUBAREA AREA(ACRES) = 7.62 SUBAREA RUNOFF(CFS) = 18.68
 EFFECTIVE AREA(ACRES) = 22.76 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) = 22.8 PEAK FLOW RATE (CFS) =
                                                      55.32
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 20.87
 FLOW VELOCITY (FEET/SEC.) = 6.09 DEPTH*VELOCITY (FT*FT/SEC.) = 3.50
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20423.00 = 1518.10 FEET.
FLOW PROCESS FROM NODE 20423.00 TO NODE 20424.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20422.00 = 1218.93 FEET.

Date: 04/21/2014 File name: LR0204ZZ.RES Page 15

File name: LR0204ZZ.RES Page 16

Date: 04/21/2014

```
_____
 UPSTREAM ELEVATION(FEET) = 1712.00 DOWNSTREAM ELEVATION(FEET) = 1703.00
 STREET LENGTH (FEET) = 258.55 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 22.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.53
 STREET FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 15.09
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.862
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                       SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                    A
                                                0.250 32
 MOBILE HOME PARK
                               0.47
                                       0.98
                      В
                               0.58
                                        0.75
                                                0.250 56
 MOBILE HOME PARK
                      В
                               2.83
 COMMERCIAL
                                        0.75
                                                0.100 56
                      A 0.03
                                                0.100 32
                                        0.98
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.39 0.75
                                              0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.261
 SUBAREA AREA (ACRES) = 5.30 SUBAREA RUNOFF (CFS) = 12.69
 EFFECTIVE AREA(ACRES) = 28.06 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) = 28.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 23.37
 FLOW VELOCITY (FEET/SEC.) = 5.86 DEPTH*VELOCITY (FT*FT/SEC.) = 3.66
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20424.00 = 1776.65 FEET.
******************
 FLOW PROCESS FROM NODE 20424.00 TO NODE 20425.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1703.00 DOWNSTREAM ELEVATION (FEET) = 1696.00
 STREET LENGTH(FEET) = 197.56 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    69.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.76
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.80
 STREET FLOW TRAVEL TIME (MIN.) = 0.55 Tc (MIN.) = 15.64
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.801
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     B 0.06 0.75 0.250
                                                        56
                      B 1.63 0.75 0.100
 COMMERCIAL
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.63 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.348
 SUBAREA AREA (ACRES) = 3.32 SUBAREA RUNOFF (CFS) = 7.59
 EFFECTIVE AREA (ACRES) = 31.38 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.29
 TOTAL AREA (ACRES) = 31.4 PEAK FLOW RATE (CFS) = 72.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.64 HALFSTREET FLOOD WIDTH (FEET) = 24.07
 FLOW VELOCITY (FEET/SEC.) = 6.04 DEPTH*VELOCITY (FT*FT/SEC.) = 3.86
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20425.00 = 1974.21 FEET.
*****************
 FLOW PROCESS FROM NODE 20425.00 TO NODE 20426.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1696.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1685.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 834.27
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.539
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                  αA
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" B
                                1.17 0.75
                                                 0.600
       Date: 04/21/2014
                                                       Page 18
                      File name: LR0204ZZ.RES
```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00

Date: 04/21/2014 Page 17 File name: LR020477.RFS

MOBILE HOME PARK B 0.01 0.75 0.250 56  COMMERCIAL B 0.54 0.75 0.100 56  COMMERCIAL A 3.24 0.98 0.100 32  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 4.60 0.98 0.600 32  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.56  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 5.00  AVERAGE FLOW DEPTH(FEET) = 0.84 FLOOD WIDTH(FEET) = 60.73	END OF SUBAREA "V" GUTTER HYDRAULICS:  DEPTH(FEET) = 0.79 FLOOD WIDTH(FEET) = 55.20  FLOW VELOCITY(FEET/SEC.) = 7.08 DEPTH*VELOCITY(FT*FT/SEC) = 5.62  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20427.00 = 3120.11 FEET.  **********************************
"V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.78	UPSTREAM NODE ELEVATION (FEET) = 1676.00  DOWNSTREAM NODE ELEVATION (FEET) = 1668.00  CHANNEL LENGTH THRU SUBAREA (FEET) = 300.94  "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250  PAVEMENT LIP (FEET) = 0.100 MANNING'S N = .0150  PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700  MAXIMUM DEPTH (FEET) = 1.00  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.425
END OF SUBAREA "V" GUTTER HYDRAULICS:  DEPTH(FEET) = 0.85 FLOOD WIDTH(FEET) = 61.32  FLOW VELOCITY(FEET/SEC.) = 5.02 DEPTH*VELOCITY(FT*FT/SEC) = 4.25  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20426.00 = 2808.48 FEET.  **********************************	SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 5.53 0.98 0.600 32  COMMERCIAL A 0.78 0.98 0.100 32  MOBILE HOME PARK A 2.12 0.98 0.250 32  RESIDENTIAL
>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<  UPSTREAM NODE ELEVATION(FEET) = 1685.00  DOWNSTREAM NODE ELEVATION (FEET) = 1676.00  CHANNEL LENGTH THRU SUBAREA (FEET) = 311.63  "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250  PAVEMENT LIP (FEET) = 0.100 MANNING'S N = .0150  PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700  MAXIMUM DEPTH (FEET) = 1.00  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.479  SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  COMMERCIAL A 1.60 0.98 0.100 32  RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 0.52 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.474  TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 104.09  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.96  AVERAGE FLOW DEPTH (FEET) = 0.82 FLOOD WIDTH (FEET) = 58.04  "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 19.88  SUBAREA AREA (ACRES) = 8.95 SUBAREA RUNOFF (CFS) = 15.88  EFFECTIVE AREA (ACRES) = 58.15 AREA-AVERAGED Fm (INCH/HR) = 0.33  AREA-AVERAGED Fp (INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.36  TOTAL AREA (ACRES) = 58.1 PEAK FLOW RATE (CFS) = 109.62  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
RESIDENTIAL "3-4 DWELLINGS/ACRE" A 6.06 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.60 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.503 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.92 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 6.98 AVERAGE FLOW DEPTH(FEET) = 0.78 FLOOD WIDTH(FEET) = 54.01 "V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.74 Tc(MIN.) = 19.16 SUBAREA AREA(ACRES) = 8.26 SUBAREA RUNOFF(CFS) = 14.86 EFFECTIVE AREA (ACRES) = 49.20 AREA-AVERAGED Fm(INCH/HR) = 0.31 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Fm(INCH/HR) = 0.31 TOTAL AREA(ACRES) = 49.2 PEAK FLOW RATE(CFS) = 96.15 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50	END OF SUBAREA "V" GUTTER HYDRAULICS:  DEPTH(FEET) = 0.83 FLOOD WIDTH(FEET) = 59.38  FLOW VELOCITY(FEET/SEC.) = 7.02 DEPTH*VELOCITY(FT*FT/SEC) = 5.82  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20473.00 = 3421.05 FEET.  **********************************

Date: 04/21/2014 File name: LR0204ZZ.RES Page 19

File name: LR0204ZZ.RES

Date: 04/21/2014

Page 20

```
MAXIMUM DEPTH(FEET) = 1.00
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.159
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.343
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               Ap SCS
                                                                                    LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  RESIDENTIAL
     LAND USE
                                                 0.100
                                                                                  "3-4 DWELLINGS/ACRE" A 21.36 0.98 0.600 32
 COMMERCIAL
                      A 0.97
                                         0.98
                                                                                                               7.94 0.98 0.100 32
 RESIDENTIAL
                                                                                  COMMERCIAL
                                                                                                       A
                                                                                  MOBILE HOME PARK A
                                                                                                             14.89 0.98 0.250 32
 "3-4 DWELLINGS/ACRE" A 13.68
                                         0.98
                                                 0.600
 MOBILE HOME PARK A
                              3.07
                                                 0.250
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                         0.98
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.25 0.75 0.600 56
                                                                                  SUBAREA AREA (ACRES) = 44.19 SUBAREA RUNOFF (CFS) = 70.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
                                                                                  EFFECTIVE AREA(ACRES) = 121.31 AREA-AVERAGED Fm(INCH/HR) = 0.38
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.40
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 125.38
                                                                                  TOTAL AREA (ACRES) = 121.3 PEAK FLOW RATE (CFS) = 194.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.14
 AVERAGE FLOW DEPTH (FEET) = 0.96 FLOOD WIDTH (FEET) = 74.77
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 21.06
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 SUBAREA AREA (ACRES) = 18.97 SUBAREA RUNOFF (CFS) = 31.53
 EFFECTIVE AREA(ACRES) = 77.12 AREA-AVERAGED Fm(INCH/HR) = 0.37
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.40
                                                                                  DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 35.28
 TOTAL AREA (ACRES) = 77.1 PEAK FLOW RATE (CFS) = 136.85
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.60 DEPTH*VELOCITY (FT*FT/SEC.) = 6.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                                  SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                  ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.98 FLOOD WIDTH (FEET) = 77.45
                                                                                  ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 FLOW VELOCITY (FEET/SEC.) = 5.24 DEPTH*VELOCITY (FT*FT/SEC) = 5.15
                                                                                  ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20429.00 = 3783.58 FEET.
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 10.78
                                                                                  PIPE-FLOW(CFS) = 33.89
*****************
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 2.11 Tc (MIN.) = 23.17
 FLOW PROCESS FROM NODE 20429.00 TO NODE 20430.00 IS CODE = 63
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.213
______
                                                                                  SUBAREA AREA(ACRES) = 44.19 SUBAREA RUNOFF(CFS) = 72.79
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  TOTAL AREA (ACRES) = 121.3 PEAK FLOW RATE (CFS) = 200.59
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 UPSTREAM ELEVATION(FEET) = 1664.00 DOWNSTREAM ELEVATION(FEET) = 1628.00
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREET LENGTH (FEET) = 1363.05 CURB HEIGHT (INCHES) = 6.0
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 166.70
                                                                                   ***STREET FLOWING FULL***
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW DEPTH(FEET) = 0.80
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 33.15
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.34
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.89
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20430.00 = 5146.63 FEET.
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                ******************
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                                  FLOW PROCESS FROM NODE 20430.00 TO NODE 20449.00 IS CODE = 63
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 172.20
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
   ***STREET FLOWING FULL***
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                _____
   STREET FLOW DEPTH (FEET) = 0.81
                                                                                  UPSTREAM ELEVATION(FEET) = 1628.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
   HALFSTREET FLOOD WIDTH (FEET) = 33.58
                                                                                  STREET LENGTH (FEET) = 1350.21 CURB HEIGHT (INCHES) = 6.0
                                                                                  STREET HALFWIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.00
 STREET FLOW TRAVEL TIME (MIN.) = 3.07 Tc (MIN.) = 24.13
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
```

Date: 04/21/2014 File name: LR0204ZZ.RES Page 21 Date: 04/21/2014 File name: LR0204ZZ.RES Page 22

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 1.32
 HALFSTREET FLOOD WIDTH (FEET) = 59.21
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.95
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.91
STREET FLOW TRAVEL TIME (MIN.) = 7.63 Tc (MIN.) = 30.79
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.865
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                                          SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
COMMERCIAL
                      A 9.50 0.98 0.100 32
RESIDENTIAL
                     A 1.03
                                          0.98
                                                 0.600
"3-4 DWELLINGS/ACRE"
                                                         32
COMMERCIAL
                       В
                               0.37
                                       0.75
                                                   0.100 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.147
SUBAREA AREA(ACRES) = 10.90 SUBAREA RUNOFF(CFS) = 16.90
EFFECTIVE AREA(ACRES) = 132.21 AREA-AVERAGED Fm(INCH/HR) = 0.36
AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.38
TOTAL AREA (ACRES) = 132.2 PEAK FLOW RATE (CFS) = 200.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.31 HALFSTREET FLOOD WIDTH(FEET) = 58.30
FLOW VELOCITY (FEET/SEC.) = 2.92 DEPTH*VELOCITY (FT*FT/SEC.) = 3.81
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.14
PIPE-FLOW(CFS) = 145.96
PIPEFLOW TRAVEL TIME (MIN.) = 3.67 Tc (MIN.) = 26.83
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.026
SUBAREA AREA (ACRES) = 10.90 SUBAREA RUNOFF (CFS) = 18.47
TOTAL AREA (ACRES) = 132.2
                               PEAK FLOW RATE (CFS) = 200.59
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 54.63
```

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.84
  HALFSTREET FLOOD WIDTH (FEET) = 34.80
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.19
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.83
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.84 FEET.
******************
 FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.83
 RAINFALL INTENSITY (INCH/HR) = 2.03
 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp (INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 132.21
 TOTAL STREAM AREA(ACRES) = 132.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                              200.59
******************
 FLOW PROCESS FROM NODE 20440.00 TO NODE 20441.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 918.39
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1706.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.596
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.189
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                  SCS Tc
                                            αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.48 0.75 0.600 56 12.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 13.51
 TOTAL AREA(ACRES) = 5.48 PEAK FLOW RATE(CFS) = 13.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20441.00 TO NODE 20442.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1706.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH(FEET) = 478.44 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

File name: LR020477.RFS

Page 24

\*\*\*STREET FLOWING FULL\*\*\*

Date: 04/21/2014 File name: LR0204ZZ.RES Page 23 Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.98
 STREET FLOW TRAVEL TIME (MIN.) = 4.92 Tc (MIN.) = 17.52
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.616
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.22 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.22 SUBAREA RUNOFF (CFS) = 10.18
 EFFECTIVE AREA(ACRES) = 10.70 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 10.7 PEAK FLOW RATE (CFS) = 20.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.24
 FLOW VELOCITY (FEET/SEC.) = 1.67 DEPTH*VELOCITY (FT*FT/SEC.) = 1.04
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 478.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 10.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20442.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20442.00 = 1396.83 FEET.
*****************
 FLOW PROCESS FROM NODE 20442.00 TO NODE 20443.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1705.00 DOWNSTREAM ELEVATION(FEET) = 1704.00
 STREET LENGTH (FEET) = 220.75 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  26.92
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.08
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.42
 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 19.07
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.486
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.59 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 6.59 SUBAREA RUNOFF (CFS) = 12.08
 EFFECTIVE AREA(ACRES) = 17.29 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 17.3 PEAK FLOW RATE (CFS) =
                                                          31.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.54
 FLOW VELOCITY (FEET/SEC.) = 2.48 DEPTH*VELOCITY (FT*FT/SEC.) = 1.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 220.8 FT WITH ELEVATION-DROP = 1.0 FT, IS 18.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20443.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20443.00 = 1617.58 FEET.
******************
 FLOW PROCESS FROM NODE 20443.00 TO NODE 20444.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1704.00 DOWNSTREAM ELEVATION(FEET) = 1702.00
 STREET LENGTH (FEET) = 263.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.93
```

File name: LR0204ZZ.RES

Page 26

STREET PARKWAY CROSSFALL(DECIMAL) = 0.020

Date: 04/21/2014

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.94
 STREET FLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 20.47
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.383
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.15 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 7.15 SUBAREA RUNOFF (CFS) = 12.45
 EFFECTIVE AREA(ACRES) = 24.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 24.4 PEAK FLOW RATE (CFS) = 42.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.85
 FLOW VELOCITY (FEET/SEC.) = 3.25 DEPTH*VELOCITY (FT*FT/SEC.) = 2.07
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 263.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 20.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20444.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20444.00 = 1881.08 FEET.
*****
 FLOW PROCESS FROM NODE 20444.00 TO NODE 20445.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1702.00 DOWNSTREAM ELEVATION (FEET) = 1701.00
 STREET LENGTH (FEET) = 498.43 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.84
   HALFSTREET FLOOD WIDTH (FEET) = 35.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.77
```

```
STREET FLOW TRAVEL TIME (MIN.) = 3.96 Tc (MIN.) = 24.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.143
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.46 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.46 SUBAREA RUNOFF (CFS) = 22.05
 EFFECTIVE AREA(ACRES) = 38.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 38.9 PEAK FLOW RATE (CFS) =
                                                          59.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.69
 FLOW VELOCITY (FEET/SEC.) = 2.14 DEPTH*VELOCITY (FT*FT/SEC.) = 1.87
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 498.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 28.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20445.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20445.00 = 2379.51 FEET.
*******************
 FLOW PROCESS FROM NODE 20445.00 TO NODE 20446.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1701.00 DOWNSTREAM ELEVATION (FEET) = 1700.00
 STREET LENGTH (FEET) = 790.41 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.01
   HALFSTREET FLOOD WIDTH (FEET) = 43.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.91
 STREET FLOW TRAVEL TIME (MIN.) = 7.00 Tc (MIN.) = 31.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.842
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 28

```
"3-4 DWELLINGS/ACRE"
                      B 22.19 0.75 0.600 56
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                       101.94
 SUBAREA AREA (ACRES) = 22.19 SUBAREA RUNOFF (CFS) = 27.83
                                                                                      ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 61.09 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                                      STREET FLOW DEPTH (FEET) = 0.71
 TOTAL AREA (ACRES) = 61.1 PEAK FLOW RATE (CFS) = 76.61
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 28.38
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.58
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 2.50 Tc (MIN.) = 30.78
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.866
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 1.03 HALFSTREET FLOOD WIDTH(FEET) = 44.50
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
 FLOW VELOCITY (FEET/SEC.) = 1.90 DEPTH*VELOCITY (FT*FT/SEC.) = 1.96
                                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                        LAND USE
                                                                                    RESIDENTIAL
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                    "3-4 DWELLINGS/ACRE" B 2.08 0.75
                                                                                                                                    0.600
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    RESIDENTIAL
                                                                                    "3-4 DWELLINGS/ACRE" A 24.90 0.98 0.600
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                    SCHOOL
                                                                                                          A 1.29 0.98 0.600 32
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
                                                                                    SCHOOL
                                                                                                            В
                                                                                                                   3.53 0.75 0.600 56
 ASSUME FULL-FLOWING PIPELINE
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 PIPE-FLOW VELOCITY (FEET/SEC.) = 3.43
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 PIPE-FLOW(CFS) = 32.99
                                                                                    SUBAREA AREA(ACRES) = 31.80 SUBAREA RUNOFF(CFS) = 37.34
                                                                                    EFFECTIVE AREA(ACRES) = 92.89 AREA-AVERAGED Fm(INCH/HR) = 0.49
 PIPEFLOW TRAVEL TIME (MIN.) = 3.84 Tc (MIN.) = 28.28
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.963
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.60
 SUBAREA AREA (ACRES) = 22.19 SUBAREA RUNOFF (CFS) = 30.24
                                                                                    TOTAL AREA(ACRES) = 92.9 PEAK FLOW RATE(CFS) = 115.25
 TOTAL AREA (ACRES) = 61.1 PEAK FLOW RATE (CFS) = 83.26
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 50.26
                                                                                    DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.54
   ***STREET FLOWING FULL***
                                                                                    FLOW VELOCITY (FEET/SEC.) = 6.69 DEPTH*VELOCITY (FT*FT/SEC.) = 4.93
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
   STREET FLOW DEPTH (FEET) = 0.89
                                                                                    ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
   HALFSTREET FLOOD WIDTH (FEET) = 37.67
                                                                                    ASSUME FULL-FLOWING PIPELINE
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.73
                                                                                    PIPE-FLOW VELOCITY (FEET/SEC.) = 11.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.54
                                                                                    PIPE-FLOW(CFS) = 36.83
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 29.65
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20446.00 = 3169.92 FEET.
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.908
*****************
                                                                                    SUBAREA AREA (ACRES) = 31.80 SUBAREA RUNOFF (CFS) = 38.56
                                                                                    TOTAL AREA (ACRES) = 92.9 PEAK FLOW RATE (CFS) = 118.79
 FLOW PROCESS FROM NODE 20446.00 TO NODE 20447.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 81.97
 STREET LENGTH (FEET) = 962.00 CURB HEIGHT (INCHES) = 8.0
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET HALFWIDTH (FEET) = 26.00
                                                                                      STREET FLOW DEPTH (FEET) = 0.68
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 26.40
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.93
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.01
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20447.00 = 4131.92 FEET.
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    FLOW PROCESS FROM NODE 20447.00 TO NODE 20448.00 IS CODE = 63
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

Page 29

Date: 04/21/2014

File name: LR0204ZZ.RES

Page 30

```
UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1645.00
STREET LENGTH (FEET) = 877.54 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 26.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
INSIDE STREET CROSSFALL (DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 143.58
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.79
 HALFSTREET FLOOD WIDTH (FEET) = 32.22
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.99
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.53
STREET FLOW TRAVEL TIME (MIN.) = 2.09 Tc (MIN.) = 31.74
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.832
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                         Fρ
                                                   Αp
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A
                              9.63
                                                  0.600 32
                                          0.98
                               12.07
                                                  0.100
                                                         32
COMMERCIAL
                      A
                                          0.98
COMMERCIAL
                        В
                              0.31
                                          0.75
                                                  0.100 56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"
                     В 2.23
                                          0.75
                                                  0.600 56
                               11.63
                                          0.75
                                                  0.600 56
SCHOOL
SCHOOL
                        Α
                                1.95
                                          0.98
                                                  0.600 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.436
SUBAREA AREA(ACRES) = 37.82
                               SUBAREA RUNOFF(CFS) = 49.57
EFFECTIVE AREA(ACRES) = 130.71 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.55
TOTAL AREA (ACRES) = 130.7 PEAK FLOW RATE (CFS) =
                                                          161.97
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 33.57
FLOW VELOCITY (FEET/SEC.) = 7.26 DEPTH*VELOCITY (FT*FT/SEC.) = 5.94
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 12.11
PIPE-FLOW(CFS) = 48.19
PIPEFLOW TRAVEL TIME (MIN.) = 1.21 Tc(MIN.) = 30.85
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.863
SUBAREA AREA (ACRES) = 37.82 SUBAREA RUNOFF (CFS) = 50.64
                                PEAK FLOW RATE(CFS) = 165.65
TOTAL AREA (ACRES) = 130.7
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 117.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.15
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.90
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20448.00 = 5009.46 FEET.
******************
 FLOW PROCESS FROM NODE 20448.00 TO NODE 20449.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1645.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
 STREET LENGTH (FEET) = 820.27 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.13
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.20
 STREET FLOW TRAVEL TIME (MIN.) = 1.92 Tc (MIN.) = 32.77
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.797
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                      SCS SOIL AREA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      A 3.48
                                     0.98
                                                0.100
                                                        32
 COMMERCIAL
 COMMERCIAL
                              6.53
                                         0.75
                                                0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.34
                                         0.98
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    в 1.38
                                         0.75
                                                0.600
                                                        56
 SCHOOL
                               0.64
                                         0.98
                                                0.600
                                                        32
                        Α
 SCHOOL
                               16.30
                                         0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
 SUBAREA AREA(ACRES) = 28.67
                              SUBAREA RUNOFF(CFS) = 37.96
 EFFECTIVE AREA(ACRES) = 159.38 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.53
```

File name: LR0204ZZ.RES

Page 32

Date: 04/21/2014

```
** PEAK FLOW RATE TABLE **
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                  NUMBER
                                                                                   1
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                           392.39 26.83 2.026 0.87 (0.39) 0.45 265.9 20420.00
                                                                                           375.80 31.99 1.823 0.86(0.40) 0.46 291.6 20440.00
 DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 36.92
 FLOW VELOCITY (FEET/SEC.) = 7.24 DEPTH*VELOCITY (FT*FT/SEC.) = 6.41
                                                                                  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                  PEAK FLOW RATE (CFS) = 392.39 Tc (MIN.) = 26.83
                                                                                  EFFECTIVE AREA(ACRES) = 265.88 AREA-AVERAGED Fm(INCH/HR) = 0.39
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.45
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                  TOTAL AREA (ACRES) =
                                                                                                     291.6
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
                                                                                  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.84 FEET.
 ASSUME FULL-FLOWING PIPELINE
                                                                                ******************
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.02
 PIPE-FLOW(CFS) = 59.04
                                                                                  FLOW PROCESS FROM NODE 20449.00 TO NODE 20450.00 IS CODE = 63
 PIPEFLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 31.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.823
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                             SUBAREA RUNOFF(CFS) = 38.64
 SUBAREA AREA(ACRES) = 28.67
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 TOTAL AREA (ACRES) = 159.4 PEAK FLOW RATE (CFS) = 199.58
                                                                                ______
                                                                                  UPSTREAM ELEVATION (FEET) = 1625.00 DOWNSTREAM ELEVATION (FEET) = 1595.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  STREET LENGTH(FEET) = 1304.02 CURB HEIGHT(INCHES) = 8.0
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  STREET HALFWIDTH (FEET) = 26.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 140.53
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
   ***STREET FLOWING FULL***
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.83
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.59
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.29
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20449.00 = 5829.73 FEET.
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
*******************
 FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 468.91
                                                                                   ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                   STREET FLOW DEPTH (FEET) = 1.18
_____
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 51.51
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.87
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.44
 TIME OF CONCENTRATION (MIN.) = 31.99
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 29.28
 RAINFALL INTENSITY (INCH/HR) = 1.82
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.922
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
 AREA-AVERAGED Fp(INCH/HR) = 0.81
                                                                                                                         Fρ
                                                                                                                                         SCS
 AREA-AVERAGED Ap = 0.53
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                               33.74 0.98
 EFFECTIVE STREAM AREA(ACRES) = 159.38
                                                                                                                                0.100
                                                                                                                                         32
                                                                                  COMMERCIAL
                                                                                                       A
 TOTAL STREAM AREA(ACRES) = 159.38
                                                                                  MOBILE HOME PARK
                                                                                                               22.38
                                                                                                                                 0.250
                                                                                                                                         56
                                                                                                       В
                                                                                                                         0.75
                                                                                                         B 19.61
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 199.58
                                                                                  COMMERCIAL
                                                                                                                         0.75
                                                                                                                                 0.100
                                                                                                                                         56
                                                                                  AGRICULTURAL FAIR COVER
 ** CONFLUENCE DATA **
                                                                                                       в 9.23
                                                                                  "ORCHARDS"
                                                                                                                          0.63
                                                                                                                                 1.000
  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                        HEADWATER
                                                                                  RESIDENTIAL
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                  "3-4 DWELLINGS/ACRE" B 8.18
                                                                                                                         0.75
                                                                                                                                 0.600
                                                                                                                                         56
    1
          200.59 26.83 2.026 0.94(0.36) 0.38 132.2 20420.00
                                                                                  RESIDENTIAL
    2
          199.58 31.99 1.823 0.81(0.43)0.53 159.4 20440.00
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       A 7.04
                                                                                                                         0.98 0.600
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.292
```

Page 33

CONFLUENCE FORMULA USED FOR 2 STREAMS.

Date: 04/21/2014

File name: LR0204ZZ.RES

Page 34

TOTAL AREA (ACRES) = 159.4 PEAK FLOW RATE (CFS) = 195.83

```
SUBAREA AREA(ACRES) = 100.18
                                SUBAREA RUNOFF(CFS) = 153.04
 EFFECTIVE AREA(ACRES) = 366.06 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.41
 TOTAL AREA (ACRES) = 391.8 PEAK FLOW RATE (CFS) = 518.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.22 HALFSTREET FLOOD WIDTH(FEET) = 53.52
 FLOW VELOCITY (FEET/SEC.) = 9.09 DEPTH*VELOCITY (FT*FT/SEC.) = 11.06
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.54
 PIPE-FLOW(CFS) = 364.25
 PIPEFLOW TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 28.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.975
 SUBAREA AREA(ACRES) = 100.18 SUBAREA RUNOFF(CFS) = 157.74
 TOTAL AREA (ACRES) = 391.8 PEAK FLOW RATE (CFS) = 535.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 171.68
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.58
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.87
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 1304.0 FT WITH ELEVATION-DROP = 30.0 FT, IS 285.1 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20450.00
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
           535.94 28.00 1.975 0.85(0.35) 0.41 366.1 20420.00
    1
    2
          503.99 33.21 1.783 0.85(0.35) 0.42
                                                391.8 20440.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 535.94 Tc (MIN.) = 28.00
 AREA-AVERAGED Fm(INCH/HR) = 0.35 AREA-AVERAGED Fp(INCH/HR) = 0.85
 AREA-AVERAGED Ap = 0.41 EFFECTIVE AREA(ACRES) = 366.06
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20450.00 = 7800.86 FEET.
******************
 FLOW PROCESS FROM NODE 20450.00 TO NODE 20451.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1530.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.86 CHANNEL SLOPE = 0.0222
```

```
CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 535.94
 FLOW VELOCITY (FEET/SEC.) = 10.48 FLOW DEPTH (FEET) = 3.14
 TRAVEL TIME (MIN.) = 4.65 Tc (MIN.) = 32.65
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20451.00 = 10722.72 FEET.
*****************
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20451.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 32.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.801
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                        Ар
                                                SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 19.78 0.75 0.600
                                                 56
                          5.95 0.75
 COMMERCIAL
                    В
                                          0.100
                                                 56
 MOBILE HOME PARK
                   В
                          6.72
                                   0.75
                                          0.250
 PUBLIC PARK
                    В
                          6.76
                                   0.75 0.850
 SCHOOL
                     В
                          5.51
                                   0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.519
 SUBAREA AREA(ACRES) = 44.72
                           SUBAREA RUNOFF (CFS) = 56.86
 EFFECTIVE AREA(ACRES) = 410.78 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 436.5
                            PEAK FLOW RATE (CFS) = 535.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.21
********************
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20452.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1530.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1273.13 CHANNEL SLOPE = 0.0157
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 535.94
 FLOW VELOCITY (FEET/SEC.) = 9.24 FLOW DEPTH (FEET) = 3.44
 TRAVEL TIME (MIN.) = 2.30 Tc (MIN.) = 34.95
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20452.00 = 11995.85 FEET.
******************
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 34.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.729
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp Ap
                                                SCS
      Date: 04/21/2014 File name: LR0204ZZ.RES
                                               Page 36
```

LAND USE	GROUP (ACRES	) (INCH/HR)	(DECIMAL)	CN	>>>>CLEAR MEMORY BANK					
"3-4 DWELLINGS/ACRE"	В 6.5	0 0.75	0.600	56						
COMMERCIAL	В 3.3		0.100	56	 *****	******	******	*****	*******	*****
RESIDENTIAL	Б 5.5	1 0.75	0.100	50	 FLOW PROCESS FROM NODE	20452 00	TO NODE	20453 NO T	S CODE =	5.4
"3-4 DWELLINGS/ACRE"	A 0.2	5 0.98	0.600	32	 					
NATURAL FAIR COVER	A 0.2	5 0.90	0.000	32	 >>>>COMPUTE TRAPEZOIDA					
"OPEN BRUSH"	в 0.0	7 0.61	1.000	66	 >>>>TRAVELTIME THRU SU					
PUBLIC PARK	В 0.1		0.850	56	 ======================================					
SUBAREA AVERAGE PERVIC				30	 ELEVATION DATA: UPSTREA					
SUBAREA AVERAGE PERVIC			0.75		 CHANNEL LENGTH THRU SUE	, ,				
		-	an) _ 10 (	0.6					EL SLOFE -	- 0.0200
SUBAREA AREA (ACRES) =		REA RUNOFF(CE			 CHANNEL BASE (FEET) =					
EFFECTIVE AREA (ACRES)				= 0.30	 MANNING'S FACTOR = 0.01		,	,	0.00	
AREA-AVERAGED Fp (INCH/		-		F2F 04	 CHANNEL FLOW THRU SUBAR				F 42	
TOTAL AREA (ACRES) =			(CFS) =	535.94	 FLOW VELOCITY (FEET/SEC.				= 5.43	
NOTE: PEAK FLOW RATE D	EFAULTED TO UPSTR	EAM VALUE			 TRAVEL TIME (MIN.) = 1				00	101 00
					 LONGEST FLOWPATH FROM N	NODE 2012	0.00 TO NO	DE 20453.	.00 = 304	191.93 FEET.
SUBAREA AREA-AVERAGED			0.55		 *****					
5M = 0.46; 30M = 0.95;	1HR = 1.25; 3HR	= 2.03; 6HR =	= 2.75; 24HI	R = 5.50						
					 FLOW PROCESS FROM NODE					
*********					 					
FLOW PROCESS FROM NODE					>>>>ADDITION OF SUBARE				.=======	
>>>>CONFLUENCE MEMORY	BANK # 1 WITH TH	E MAIN-STREAN	MEMORY<	<<	MAINLINE Tc(MIN.) = 4					
		=========		========	 * 100 YEAR RAINFALL INT	TENSITY (IN	ICH/HR) =	1.502		
					 SUBAREA LOSS RATE DATA(	(AMC II):				
** MAIN STREAM CONFLUE	NCE DATA **				 DEVELOPMENT TYPE/	SCS SOII	AREA	Fp	Ap	SCS
STREAM Q T	c Intensity F	p(Fm) Ap	Ae	HEADWATER	 LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
NUMBER (CFS) (MI	N.) (INCH/HR) (IN	CH/HR)	(ACRES)	NODE	 MOBILE HOME PARK	В	20.13	0.75	0.250	56
1 535.94 34	1.729 0.8	3 ( 0.35) 0.42	2 421.0	20420.00	 RESIDENTIAL					
2 506.39 40	1.588 0.8	3 ( 0.36) 0.43	3 446.7	20440.00	 "3-4 DWELLINGS/ACRE"	В	19.32	0.75	0.600	56
LONGEST FLOWPATH FROM	NODE 20420.00 TO	NODE 20452.	.00 = 1199	95.85 FEET.	 SCHOOL	В	8.94	0.75	0.600	56
					 COMMERCIAL	В	4.10	0.75	0.100	56
** MEMORY BANK # 1 CC	NFLUENCE DATA **				 PUBLIC PARK	В	1.64	0.75	0.850	56
PEAK FLOW RATE(CFS) =	3684.37 To	(MIN.) = 42	2.44		 RESIDENTIAL					
AREA-AVERAGED Fm (INCH/		, ,			 "3-4 DWELLINGS/ACRE"	A	0.19	0.98	0.600	32
	4897.4				 SUBAREA AVERAGE PERVIOU			H/HR) = 0	.75	
LONGEST FLOWPATH FROM	NODE 20120.00 TO	NODE 20452.	.00 = 270	96.44 FEET.	 SUBAREA AVERAGE PERVIOU					
					 SUBAREA AREA(ACRES) =					
COMPUTED CONFLUENCE ES	TIMATES ARE AS FO	T.T.OWS •			 UNIT-HYDROGRAPH DATA:	01.02				
UNIT-HYDROGRAPH DATA:	711111111111111111111111111111111111111	LLOWO.			 RAINFALL(INCH): 5M= 0.4	15:30M= 0	93:1H= 1 2	2:3H= 2 04	l:6H= 2 82:	24H= 6 78
RAINFALL(INCH): 5M= 0.	45:30M= 0 93:1H=	1 22:3H= 2 04	1:6H= 2 82:1	24H= 6 80	 S-GRAPH: VALLEY (DEV.) =					2111 0.70
S-GRAPH: VALLEY (DEV.) =				2 111 0.00	 MOUNTAIN= 0.0	-	•			ł
	0%; FOOTHILL= 0.0				 Tc(HR) = 0.74; LAG(HR)					
Tc(HR) = 0.71; LAG(HR)					 USED SIERRA MADRE DEPTH					,
, , , , , ,		,								
USED SIERRA MADRE DEPT					 DEPTH-AREA FACTORS: 5M			Ink - 0.7	0,	
DEPTH-AREA FACTORS: 5M		70; IHR = U.	/0;		 3HR = 0.97; 6HR = 0.98;			IDEA)	F200 4	
3HR = 0.97; 6HR = 0.98		(30000)	F 2 4 4 1		 UNIT-INTERVAL (MIN) = 5			,		101 02 5555
UNIT-INTERVAL(MIN) =					 LONGEST FLOWPATH FROM N			DE 20453.	00 = 304	191.93 FEET.
LONGEST FLOWPATH FROM			.00 = 2709	96.44 FEET.	EQUIVALENT BASIN FACTO			/- 0 -	0040 - '	0.6.000
EQUIVALENT BASIN FACT					Lca/L=0.3,n=.0302; Lca					_=U.6, n=.0232
Lca/L=0.3,n=.0321; Lc				=U.6, n=.0247	TIME OF PEAK FLOW(HR) =			. ,	1498.95	
TIME OF PEAK FLOW(HR)		OLUME (AF) =	1482.58		UNIT-HYDROGRAPH PEAK FI					
PEAK FLOW RATE(CFS) =	4010.20				TOTAL AREA(ACRES) =	5398.4		FLOW RATE (	(CFS) =	4010.20
					NOTE: PEAK FLOW RATE DE	FAULTED I	O UPSTREAM	I VALUE		
******										
FLOW PROCESS FROM NODE					SUBAREA AREA-AVERAGED R					
					5M = 0.46; 30M = 0.95;	1HR = 1.2	15; 3HR = 2	.03; 6HR =	2.75; 24F	IR = 5.50

Date: 04/21/2014 File name: LR0204ZZ.RES Page 37 Date: 04/21/2014

File name: LR0204ZZ.RES

Page 38

\* FLOW PROCESS FROM NODE 20453.00 TO NODE 20454.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1395.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3128.68 CHANNEL SLOPE = 0.0144 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00 CHANNEL FLOW THRU SUBAREA(CFS) = 4010.20 FLOW VELOCITY (FEET/SEC.) = 28.28 FLOW DEPTH (FEET) = 5.94 TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 46.04LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc (MIN.) = 46.04\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.465 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN SCHOOL в 17.44 0.75 0.600 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 3.70 0.75 0.600 56 PUBLIC PARK 9.17 0.75 0.850 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" В 5.37 0.75 0.500 COMMERCIAL В 1.64 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625 SUBAREA AREA(ACRES) = 37.32 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.82;24H= 6.78 S-GRAPH: VALLEY(DEV.) = 62.9%; VALLEY(UNDEV.)/DESERT= 37.1% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.77; LAG(HR) = 0.61; Fm(INCH/HR) = 0.55; Ybar = 0.53 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.78; 30M = 0.78; 1HR = 0.78; 3HR = 0.97; 6HR = 0.98; 24HR = 0.99UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5435.8 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237; Lca/L=0.6,n=.0221 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1507.76 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3887.45 TOTAL AREA (ACRES) = 5435.8 PEAK FLOW RATE (CFS) = 4010.20NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

File name: LR0204ZZ.RES Page 39

>>>>STORE PEAK FLOWRATE TABLE TO A FILE<

-----

PEAK FLOWRATE TABLE FILE NAME: 20454.DNA

\_\_\_\_\_\_

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 5435.8 TC (MIN.) = 46.04

AREA-AVERAGED Fm (INCH/HR) = 0.55 Ybar = 0.53

PEAK FLOW RATE (CFS) = 4010.20

\_\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20539

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0205ZZ.DAT

Date: 04/21/2014

TIME/DATE OF STUDY: 08:19 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB		-GEOMETI		MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	==========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

File name: LR020577.RFS

Page 1

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc S-GRAPH TYPE PERCENTAGE (DECIMAL) 1.000 VALLEY (DEVELOPED) FOOTHILL 0.000 MOUNTAIN 0.000 VALLEY (UNDEVELOPED) / DESERT 0.000 DESERT (UNDEVELOPED) 0.000 PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20500.00 TO NODE 20501.00 IS CODE = 21 \_\_\_\_\_\_ >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 672.35 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1591.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.525 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.813 SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.95 0.75 0.600 56 15.53 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.88 0.98 0.600 32 15.53 AGRICULTURAL FAIR COVER 0.12 0.88 1.000 44 26.60 "ORCHARDS" SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.612 SUBAREA RUNOFF(CFS) = 8.25 8.25 TOTAL AREA (ACRES) = 3.95 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50 FLOW PROCESS FROM NODE 20501.00 TO NODE 20502.00 IS CODE = 63

Date: 04/21/2014 File name: LR0205ZZ.RES Page 2

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

```
>>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1591.00 DOWNSTREAM ELEVATION(FEET) = 1587.00
 STREET LENGTH (FEET) = 262.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.04
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH(FEET) = 0.49 FLOOD WIDTH(FEET) = 18.00
   FULL HALF-STREET VELOCITY (FEET/SEC.) = 3.26
   SPLIT DEPTH(FEET) = 0.26 SPLIT FLOOD WIDTH(FEET) = 6.71
   SPLIT FLOW(CFS) = 1.08 SPLIT VELOCITY(FEET/SEC.) = 1.91
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.59
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 16.87
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.677
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.30
                                          0.75
                                                   0.600 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.37
                                          0.98
                                                   0.600
                                                           32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                         Α
                                 0.16
                                        0.88
                                                 1.000 44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.617
 SUBAREA AREA(ACRES) = 3.83 SUBAREA RUNOFF(CFS) = 7.57
 EFFECTIVE AREA(ACRES) = 7.78 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.61
 TOTAL AREA(ACRES) = 7.8 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 3.26 DEPTH*VELOCITY (FT*FT/SEC.) = 1.59
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20502.00 = 935.03 FEET.
******************
```

FLOW PROCESS FROM NODE 20502.00 TO NODE 20503.00 IS CODE = 63

Date: 04/21/2014 File name: LR0205ZZ.RES Page 3

UPSTREAM ELEVATION(FEET) = 1587.00 DOWNSTREAM ELEVATION(FEET) = 1580.00 STREET LENGTH(FEET) = 296.66 CURB HEIGHT(INCHES) = 6.0

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL (DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020

STREET HALFWIDTH (FEET) = 18.00

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.00

\*\*\*STREET FLOW SPLITS OVER STREET-CROWN\*\*\* FULL DEPTH (FEET) = 0.49 FLOOD WIDTH (FEET) = 18.00 FULL HALF-STREET VELOCITY (FEET/SEC.) = 4.06 SPLIT DEPTH(FEET) = 0.39 SPLIT FLOOD WIDTH(FEET) = 13.27 SPLIT FLOW(CFS) = 6.37 SPLIT VELOCITY(FEET/SEC.) = 3.39 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.49HALFSTREET FLOOD WIDTH (FEET) = 18.00 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.06 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.97 STREET FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 18.09 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.567 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Aρ GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL B 2.45 "3-4 DWELLINGS/ACRE" 0.75 0.600 56 B 1.73 0.75 MOBILE HOME PARK 0.250 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.21 0.98 0.600 32 0.20 0.98 0.250 MOBILE HOME PARK AGRICULTURAL FAIR COVER 0.11 0.88 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466 SUBAREA AREA(ACRES) = 4.70 SUBAREA RUNOFF(CFS) = 9.34 EFFECTIVE AREA (ACRES) = 12.48 AREA-AVERAGED Fm(INCH/HR) = 0.44 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.56TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) = 23.90

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

FLOW PROCESS FROM NODE 20503.00 TO NODE 20504.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

<sup>&</sup>gt;>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA

```
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
       Date: 04/21/2014 File name: LR0205ZZ.RES
                                                             Page 5
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.85
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.57
 STREET FLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 21.05
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.344
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                       Fρ
      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.33 0.75 0.600 56 MOBILE HOME PARK B 1.58 0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.506
 SUBAREA AREA (ACRES) = 5.91 SUBAREA RUNOFF (CFS) = 10.45
 EFFECTIVE AREA(ACRES) = 24.81 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) =
                                                             44.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 FLOW VELOCITY (FEET/SEC.) = 5.02 DEPTH*VELOCITY (FT*FT/SEC.) = 2.72
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20505.00 = 2035.25 FEET.
*******************
 FLOW PROCESS FROM NODE 20505.00 TO NODE 20506.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1560.00 DOWNSTREAM ELEVATION(FEET) = 1535.00
 STREET LENGTH (FEET) = 1240.51 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
```

Date: 04/21/2014 File name: LR0205ZZ.RES

Page 6

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.02
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.04
 STREET FLOW TRAVEL TIME (MIN.) = 4.12 Tc (MIN.) = 25.16
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.105
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                      Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.33
                                          0.75
                                                  0.600 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.53 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 18.86
                                SUBAREA RUNOFF (CFS) = 27.56
 EFFECTIVE AREA(ACRES) = 43.67 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 43.7 PEAK FLOW RATE (CFS) =
                                                           66.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.45
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.48
 FLOW VELOCITY (FEET/SEC.) = 5.22 DEPTH*VELOCITY (FT*FT/SEC.) = 3.29
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1240.5 FT WITH ELEVATION-DROP = 25.0 FT, IS 39.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20506.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20506.00 = 3275.76 FEET.
******************
 FLOW PROCESS FROM NODE 20506.00 TO NODE 20507.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1535.00 DOWNSTREAM ELEVATION(FEET) = 1518.00
 STREET LENGTH (FEET) = 947.01 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.06
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.24
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.50
 STREET FLOW TRAVEL TIME (MIN.) = 3.01 Tc (MIN.) = 28.18
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.967
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.54 0.75 0.600
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 9.86 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 16.40 SUBAREA RUNOFF (CFS) = 21.20
 EFFECTIVE AREA(ACRES) = 60.07 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.55
 TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) = 82.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.55
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.11
 FLOW VELOCITY (FEET/SEC.) = 5.33 DEPTH*VELOCITY (FT*FT/SEC.) = 3.64
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 947.0 FT WITH ELEVATION-DROP = 17.0 FT, IS 35.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20507.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20507.00 = 4222.77 FEET.
******************
 FLOW PROCESS FROM NODE 20507.00 TO NODE 20508.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1490.50
 STREET LENGTH (FEET) = 1523.12 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   92.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.89
```

Date: 04/21/2014 File name: LR0205ZZ.RES

Page 8

```
STREET FLOW TRAVEL TIME (MIN.) = 4.62 Tc (MIN.) = 32.79
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.796
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Ар
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.25
                                          0.75
                                                  0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.62
                                         0.98
                                                  0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                               SUBAREA RUNOFF(CFS) = 20.86
 SUBAREA AREA(ACRES) = 17.87
 EFFECTIVE AREA(ACRES) = 77.94 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 77.9
                               PEAK FLOW RATE(CFS) =
                                                           93.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.51
 FLOW VELOCITY (FEET/SEC.) = 5.52 DEPTH*VELOCITY (FT*FT/SEC.) = 3.92
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1523.1 FT WITH ELEVATION-DROP = 27.5 FT, IS 34.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20508.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20508.00 = 5745.89 FEET.
******************
 FLOW PROCESS FROM NODE 20508.00 TO NODE 20509.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1490.50 DOWNSTREAM ELEVATION(FEET) = 1490.00
 STREET LENGTH (FEET) = 621.21 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     94.94
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.21
   HALFSTREET FLOOD WIDTH (FEET) = 53.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.69
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.04
 STREET FLOW TRAVEL TIME (MIN.) = 6.12 Tc (MIN.) = 38.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.621
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.36 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 2.36 SUBAREA RUNOFF (CFS) = 2.20
 EFFECTIVE AREA(ACRES) = 80.30 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
                                PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 80.3
                                                          93.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.20 HALFSTREET FLOOD WIDTH(FEET) = 52.85
 FLOW VELOCITY (FEET/SEC.) = 1.69 DEPTH*VELOCITY (FT*FT/SEC.) = 2.03
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 2.86
 PIPE-FLOW(CFS) =
                   31.63
 PIPEFLOW TRAVEL TIME (MIN.) = 3.62 Tc (MIN.) = 36.41
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687
 SUBAREA AREA(ACRES) = 2.36 SUBAREA RUNOFF(CFS) = 2.34
 TOTAL AREA(ACRES) = 80.3
                              PEAK FLOW RATE(CFS) = 93.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 62.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.05
   HALFSTREET FLOOD WIDTH (FEET) = 45.28
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20509.00 = 6367.10 FEET.
******************
 FLOW PROCESS FROM NODE 20509.00 TO NODE 20518.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1489.50
 STREET LENGTH (FEET) = 654.22 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

File name: LR020577.RFS

Page 10

Date: 04/21/2014

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 1.22
  HALFSTREET FLOOD WIDTH (FEET) = 53.58
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.66
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.02
STREET FLOW TRAVEL TIME (MIN.) = 6.57 Tc (MIN.) = 42.98
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.527
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                           SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A
                               2.47
                                           0.98 0.600 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA(ACRES) = 2.47
                                 SUBAREA RUNOFF (CFS) = 2.09
EFFECTIVE AREA(ACRES) = 82.77 AREA-AVERAGED Fm(INCH/HR) = 0.47
AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
TOTAL AREA (ACRES) = 82.8
                                 PEAK FLOW RATE(CFS) =
                                                             93.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.21 HALFSTREET FLOOD WIDTH(FEET) = 53.34
FLOW VELOCITY (FEET/SEC.) = 1.66 DEPTH*VELOCITY (FT*FT/SEC.) = 2.01
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 2.91
PIPE-FLOW(CFS) = 36.61
PIPEFLOW TRAVEL TIME (MIN.) = 3.75 Tc (MIN.) = 40.16
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.591
SUBAREA AREA(ACRES) = 2.47 SUBAREA RUNOFF(CFS) = 2.24
TOTAL AREA (ACRES) = 82.8
                                 PEAK FLOW RATE (CFS) = 93.84
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 57.22
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 1.03
 HALFSTREET FLOOD WIDTH (FEET) = 44.31
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.47
```

```
LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 40.16
 RAINFALL INTENSITY (INCH/HR) = 1.59
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.83
 AREA-AVERAGED Ap = 0.56
 EFFECTIVE STREAM AREA(ACRES) = 82.77
 TOTAL STREAM AREA(ACRES) = 82.77
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               93.84
*******************
 FLOW PROCESS FROM NODE 20510.00 TO NODE 20511.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.77
 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1590.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.909
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.683
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                SCS Tc
                                          αA
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           0.24
                                   0.98
                                         0.600
                                                32 13.43
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                     A 0.98
                                   0.88
                                         1.000
                                                44 23.01
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           0.57
                                   0.75
                                         0.600
                                                56 13.43
                     R
 AGRICULTURAL FAIR COVER
                     В
                           1.82
                                   0.63 1.000 65 23.01
 "ORCHARDS"
                           0.06
                                                56 9.91
 COMMERCIAL
                     R
                                   0.75
                                         0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA RUNOFF (CFS) = 10.00
 TOTAL AREA(ACRES) = 3.67 PEAK FLOW RATE(CFS) = 10.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
FLOW PROCESS FROM NODE 20511.00 TO NODE 20512.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1590.00 DOWNSTREAM ELEVATION (FEET) = 1580.00
```

File name: LR020577.RFS

Page 12

Date: 04/21/2014

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.51

```
STREET LENGTH (FEET) = 249.41 CURB HEIGHT (INCHES) = 8.0
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.33
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREET FLOW DEPTH (FEET) = 0.56
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 19.94
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.92
                                                                                    PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 12.26
   STREET FLOW DEPTH (FEET) = 0.41
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.242
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.40
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fp
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.82
                                                                                       LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 10.85
                                                                                  AGRICULTURAL FAIR COVER
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.487
                                                                                  "ORCHARDS"
                                                                                                              1.37
                                                                                                                          0.88
                                                                                                                                  1.000
                                                                                                         Α
                                                                                                       A 1.25
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  MOBILE HOME PARK
                                                                                                                          0.98
                                                                                                                                  0.250
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap SCS
                                                                                  AGRICULTURAL FAIR COVER
                                                                                                        B 1.07
                                                                                                                                  1.000
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "ORCHARDS"
                                                                                                                          0.63
                                                                                                       В 2.91
 AGRICULTURAL FAIR COVER
                                                                                  MOBILE HOME PARK
                                                                                                                          0.75 0.250
                                                 1.000
 "ORCHARDS"
                              1.59
                        A
                                         0.88
                                                       44
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 0.58
                                                                                                                          0.75 0.600
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                              2.00
                                         0.63
                                                 1.000
                                                        65
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.533
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.46
                                         0.75
                                               0.600 56
                                                                                  SUBAREA AREA(ACRES) = 7.18 SUBAREA RUNOFF(CFS) = 18.26
                                                 0.250 56
                                                                                  EFFECTIVE AREA(ACRES) = 15.48 AREA-AVERAGED Fm(INCH/HR) = 0.54
 MOBILE HOME PARK
                       В
                                0.58
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.866
                                                                                  TOTAL AREA (ACRES) = 15.5 PEAK FLOW RATE (CFS) = 37.63
 SUBAREA AREA(ACRES) = 4.63
                               SUBAREA RUNOFF(CFS) = 11.85
 EFFECTIVE AREA(ACRES) = 8.30 AREA-AVERAGED Fm(INCH/HR) = 0.65
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.88
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 TOTAL AREA(ACRES) = 8.3 PEAK FLOW RATE(CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.69
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.84 DEPTH*VELOCITY (FT*FT/SEC.) = 2.28
                                                                                  LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20513.00 = 1124.68 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 *******************
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 14.37
 FLOW VELOCITY (FEET/SEC.) = 4.70 DEPTH*VELOCITY (FT*FT/SEC.) = 2.10
                                                                                  FLOW PROCESS FROM NODE 20513.00 TO NODE 20514.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20512.00 = 818.18 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                                  >>>> (STREET TABLE SECTION # 18 USED) <<<<
 FLOW PROCESS FROM NODE 20512.00 TO NODE 20513.00 IS CODE = 63
                                                                                 _____
                                                                                  UPSTREAM ELEVATION(FEET) = 1575.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
                                                                                  STREET LENGTH (FEET) = 416.53 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 26.00
_____
 UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1575.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET LENGTH (FEET) = 306.50 CURB HEIGHT (INCHES) = 8.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

Page 13

Date: 04/21/2014

File name: LR020577.RFS

Date: 04/21/2014 File name: LR0205ZZ.RES Page 14

44

32

56

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.68
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.50
 STREET FLOW TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 14.14
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.975
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                         SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK B
RESIDENTIAL
                               3.78 0.98 0.250 32
                                6.42
                                         0.75 0.250 56
 "3-4 DWELLINGS/ACRE" B 0.82 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.276
 SUBAREA AREA(ACRES) = 11.02 SUBAREA RUNOFF(CFS) = 27.26
 EFFECTIVE AREA(ACRES) = 26.50 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.53
 TOTAL AREA(ACRES) = 26.5 PEAK FLOW RATE(CFS) = 61.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.07
 FLOW VELOCITY (FEET/SEC.) = 3.94 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20514.00 = 1541.21 FEET.
****************
 FLOW PROCESS FROM NODE 20514.00 TO NODE 20515.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1565.00
 STREET LENGTH (FEET) = 395.53 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.04
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.50
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH(FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
 STREET FLOW TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 15.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.795
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                              5.83 0.75 0.250
 MOBILE HOME PARK
                     В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.98 0.75 0.600
                                                        56
 MOBILE HOME PARK A 0.20 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
 SUBAREA AREA (ACRES) = 11.01 SUBAREA RUNOFF (CFS) = 24.66
 EFFECTIVE AREA(ACRES) = 37.51 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 37.5 PEAK FLOW RATE (CFS) = 81.56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.57
 FLOW VELOCITY (FEET/SEC.) = 4.41 DEPTH*VELOCITY (FT*FT/SEC.) = 3.35
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20515.00 = 1936.74 FEET.
*******************
 FLOW PROCESS FROM NODE 20515.00 TO NODE 20516.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1565.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
 STREET LENGTH (FEET) = 1215.58 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 115.44
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.87
 STREET FLOW TRAVEL TIME (MIN.) = 3.10 Tc (MIN.) = 18.79
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.509
 SUBAREA LOSS RATE DATA (AMC II):
```

Page 16

Date: 04/21/2014 File name: LR0205ZZ.RES Page 15 Date: 04/21/2014 File name: LR0205ZZ.RES

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 20.48 0.75 0.600 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 2.53 0.98 0.600 32 MOBILE HOME PARK B 12.12 0.75 0.250 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.77 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.479 SUBAREA AREA (ACRES) = 35.13 SUBAREA RUNOFF(CFS) = 67.68	"3-4 DWELLINGS/ACRE" A 23.04 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 11.30 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA(ACRES) = 34.34 SUBAREA RUNOFF(CFS) = 54.26 EFFECTIVE AREA(ACRES) = 106.98 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.52 TOTAL AREA(ACRES) = 107.0 PEAK FLOW RATE(CFS) = 179.89
EFFECTIVE AREA (ACRES) = 72.64 AREA-AVERAGED FM (INCH/HR) = 0.37  AREA-AVERAGED FP (INCH/HR) = 0.77 AREA-AVERAGED AP = 0.49  TOTAL AREA (ACRES) = 72.6 PEAK FLOW RATE (CFS) = 139.56  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.96  END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH (FEET) = 0.78 HALFSTREET FLOOD WIDTH (FEET) = 31.86  FLOW VELOCITY (FEET/SEC.) = 6.95 DEPTH*VELOCITY (FT*FT/SEC.) = 5.45  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 1215.6 FT WITH ELEVATION-DROP = 35.0 FT, IS 93.7 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20516.00  LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20516.00 = 3152.32 FEET.	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.90
FLOW PROCESS FROM NODE 20516.00 TO NODE 20517.00 IS CODE = 63  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>>> (STREET TABLE SECTION # 18 USED) <>><  UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1510.00  STREET LENGTH(FEET) = 1115.01 CURB HEIGHT(INCHES) = 8.0  STREET HALFWIDTH(FEET) = 26.00	UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1489.50  STREET LENGTH(FEET) = 1340.04 CURB HEIGHT(INCHES) = 8.0  STREET HALFWIDTH(FEET) = 26.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.95	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.99  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 208.67  ***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 166.71  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH (FEET) = 0.88  HALFSTREET FLOOD WIDTH (FEET) = 36.80  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.21  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.48  STREET FLOW TRAVEL TIME(MIN.) = 2.99 Tc(MIN.) = 21.78  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.296  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL	STREET FLOW DEPTH(FEET) = 0.97  HALFSTREET FLOOD WIDTH(FEET) = 41.07  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.23  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.03  STREET FLOW TRAVEL TIME(MIN.) = 3.59 Tc(MIN.) = 25.37  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.095  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" A 37.81 0.98 0.600 32  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 4.14 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.95

 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 17
 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 18

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 41.95
                               SUBAREA RUNOFF (CFS) = 57.52
                                                                                 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 148.93 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                                 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 AREA-AVERAGED Fp (INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.55
                                                                               ______
 TOTAL AREA (ACRES) = 148.9 PEAK FLOW RATE (CFS) = 218.09
                                                                                 UPSTREAM NODE ELEVATION (FEET) = 1489.50
                                                                                 DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW LENGTH (FEET) = 2632.61 MANNING'S N = 0.013
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH OF FLOW IN 60.0 INCH PIPE IS 42.5 INCHES
 DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 41.74
                                                                                 PIPE-FLOW VELOCITY (FEET/SEC.) = 20.42
 FLOW VELOCITY (FEET/SEC.) = 6.30 DEPTH*VELOCITY (FT*FT/SEC.) = 6.18
                                                                                 PIPE-FLOW(CFS) = 303.97
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
       AND L = 1340.0 FT WITH ELEVATION-DROP = 20.5 FT, IS 79.2 CFS,
                                                                                 PIPEFLOW TRAVEL TIME (MIN.) = 2.31 Tc (MIN.) = 27.68
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20518.00
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.989
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20518.00 = 5607.37 FEET.
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                       SCS
LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
                                                                                 SCHOOL
                                                                                                              21.65
                                                                                                                        0.98
                                                                                                                                0.600
                                                                                                                                        32
______
                                                                                 RESIDENTIAL
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                      A 27.03
                                                                                                                        0.98
                                                                                                                                0.600
                                                                                                                                        32
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                 MOBILE HOME PARK
                                                                                                      A 8.46
                                                                                                                        0.98
                                                                                                                                0.250
                                                                                                                                        32
_____
                                                                                                             7.51
                                                                                 SCHOOL
                                                                                                        B
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                                                        56
 TOTAL NUMBER OF STREAMS = 2
                                                                                 RESIDENTIAL
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                                     В 5.29
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                                        0.75 0.600
                                                                                                                                        56
 TIME OF CONCENTRATION (MIN.) = 25.37
                                                                                                      B 2.31 0.75 0.250
                                                                                                                                        56
                                                                                 MOBILE HOME PARK
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 RAINFALL INTENSITY (INCH/HR) = 2.10
 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
 AREA-AVERAGED Fp (INCH/HR) = 0.86
                                                                                 SUBAREA AREA (ACRES) = 72.25 SUBAREA RUNOFF (CFS) = 96.26
                                                                                 EFFECTIVE AREA(ACRES) = 273.48 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Ap = 0.55
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.55
 EFFECTIVE STREAM AREA(ACRES) = 148.93
 TOTAL STREAM AREA(ACRES) = 148.93
                                                                                 TOTAL AREA(ACRES) = 304.0
                                                                                                               PEAK FLOW RATE(CFS) =
                                                                                                                                        371.74
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 218.09
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 ** CONFLUENCE DATA **
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
  STREAM Q Tc Intensity Fp(Fm)
                                         Ар Ае
                                                       HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                (ACRES) NODE
                                                                                 STREET CROSS-SECTION INFORMATION:
    1
           93.84 40.16 1.591 0.83(0.47) 0.56 82.8 20500.00
                                                                                 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
           218.09 25.37 2.095 0.86(0.47) 0.55 148.9 20510.00
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 ** PEAK FLOW RATE TABLE **
                                                                                 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                               Ae
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
  STREAM
          Q Tc Intensity Fp(Fm)
                                           Aр
                                                       HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                (ACRES) NODE
    1
          303.97 25.37 2.095 0.85(0.47) 0.55 201.2 20510.00
                                                                                 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
          244.30 40.16 1.591 0.85(0.47) 0.55 231.7 20500.00
    2
                                                                                 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 67.77
                                                                                   ***STREET FLOWING FULL***
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 PEAK FLOW RATE (CFS) = 303.97 Tc (MIN.) = 25.37
                                                                                  STREET FLOW DEPTH (FEET) = 0.69
 EFFECTIVE AREA(ACRES) = 201.23 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 27.03
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.55
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.71
 TOTAL AREA(ACRES) = 231.7
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.24
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
                                                                                 ** PEAK FLOW RATE TABLE **
*******************
                                                                                  STREAM
                                                                                            Q Tc Intensity Fp(Fm)
                                                                                                                         Ap
                                                                                                                                       HEADWATER
                                                                                                                               AΘ
 FLOW PROCESS FROM NODE 20518.00 TO NODE 20519.00 IS CODE = 33
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                (ACRES)
                                                                                                                                       NODE
```

Date: 04/21/2014 File name: LR0205ZZ.RES Page 19

File name: LR0205ZZ.RES

Date: 04/21/2014

Page 20

```
371.74 27.68 1.989 0.87(0.48) 0.55
                                                 273.5 20510.00
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
           289.81 42.55 1.536 0.87(0.48) 0.55
                                                 304.0 20500.00
                                                                                    STREET FLOW DEPTH (FEET) = 0.70
 NEW PEAK FLOW DATA ARE:
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 27.52
 PEAK FLOW RATE (CFS) = 371.74 Tc (MIN.) = 27.68
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.87
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.87
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.39
 AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 273.48
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20519.00 = 9653.93 FEET.
                                                                                   ** PEAK FLOW RATE TABLE **
                                                                                   STREAM
                                                                                              0
                                                                                                    Tc Intensity Fp(Fm)
                                                                                                                                  Ae
                                                                                                                                          HEADWATER
********************
                                                                                   NUMBER
                                                                                             (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                  (ACRES) NODE
                                                                                            444.41 28.95 1.936 0.86(0.49) 0.57 341.5 20510.00
 FLOW PROCESS FROM NODE 20519.00 TO NODE 20520.00 IS CODE = 33
                                                                                    1
                                                                                            341.60 43.88 1.508 0.86(0.49) 0.57 372.0 20500.00
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                  NEW PEAK FLOW DATA ARE:
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                   PEAK FLOW RATE (CFS) = 444.41 Tc (MIN.) = 28.95
                                                                                  AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.86
______
 UPSTREAM NODE ELEVATION (FEET) = 1440.00
                                                                                  AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 341.49
                                                                                  LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20520.00 = 11206.45 FEET.
 DOWNSTREAM NODE ELEVATION (FEET) = 1410.00
 FLOW LENGTH (FEET) = 1552.52 MANNING'S N = 0.013
                                                                                 ************************
 USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
                                                                                   FLOW PROCESS FROM NODE 20520.00 TO NODE 20536.00 IS CODE = 33
 DEPTH OF FLOW IN 66.0 INCH PIPE IS 44.5 INCHES
                                                                                 ______
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.81
                                                                                  >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 PIPE-FLOW(CFS) = 371.74
                                                                                  >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                 UPSTREAM NODE ELEVATION (FEET) = 1410.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 28.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.936
                                                                                  DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
                                                                                  FLOW LENGTH (FEET) = 1041.51 MANNING'S N = 0.013
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                        Fρ
                                                  Αp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
                                                                                  DEPTH OF FLOW IN 72.0 INCH PIPE IS 52.1 INCHES
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                                       32
                     A
                            13.85
                                         0.98
                                                 0.600
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 20.26
                       A 16.29
                                         0.98
                                                 0.600
                                                       32
 SCHOOL
                                                                                  PIPE-FLOW(CFS) = 444.41
 RESIDENTIAL
                                                                                   *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                        B 15.89
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                 0.600
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 29.87
 PUBLIC PARK
                         В
                              9.87
                                         0.75
                                                 0.850
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.900
                                12.11
                                         0.75
                                                 0.600 56
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 SCHOOL
                         В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                   αA
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.636
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       LAND USE
 SUBAREA AREA(ACRES) = 68.01 SUBAREA RUNOFF(CFS) = 85.66
                                                                                  RESIDENTIAL
 EFFECTIVE AREA(ACRES) = 341.49 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                   "3-4 DWELLINGS/ACRE" A 3.22
                                                                                                                          0.98
                                                                                                                                  0.600
                                                                                                                                           32
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.57
                                                                                  RESIDENTIAL
 TOTAL AREA (ACRES) = 372.0 PEAK FLOW RATE (CFS) = 444.41
                                                                                   "3-4 DWELLINGS/ACRE" B 2.36 0.75 0.600
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                                                SUBAREA RUNOFF(CFS) = 6.89
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   SUBAREA AREA(ACRES) = 5.58
                                                                                  EFFECTIVE AREA(ACRES) = 347.07 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.57
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                             STREET HALFWIDTH (FEET) = 26.00
                                                                                  TOTAL AREA(ACRES) = 377.5
                                                                                                                  PEAK FLOW RATE (CFS) =
                                                                                                                                          444.41
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET CROSS-SECTION INFORMATION:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 72.67
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   ***STREET FLOWING FULL***
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

Date: 04/21/2014 File name: LR0205ZZ.RES Page 21 Date: 04/21/2014

File name: LR0205ZZ.RES Page 22

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                              STREET HALFWIDTH (FEET) = 18.00
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET.
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
*************************
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20536.00 TO NODE 20536.00 IS CODE = 1
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               ***STREET FLOWING FULL***
______
 TOTAL NUMBER OF STREAMS = 2
                                                                               STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                               STREET FLOW DEPTH (FEET) = 0.58
                                                                               HALFSTREET FLOOD WIDTH (FEET) = 22.22
 TIME OF CONCENTRATION (MIN.) = 29.87
 RAINFALL INTENSITY (INCH/HR) = 1.90
                                                                               AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.76
 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                               PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.61
 AREA-AVERAGED Fp (INCH/HR) = 0.86
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 4.66 Tc (MIN.) = 19.21
 AREA-AVERAGED Ap = 0.57
                                                                              * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.476
 EFFECTIVE STREAM AREA(ACRES) = 347.07
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 TOTAL STREAM AREA(ACRES) = 377.54
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fp
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 444.41
                                                                                  LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              RESIDENTIAL
**********************
                                                                              "3-4 DWELLINGS/ACRE" A 21.08 0.98 0.600
 FLOW PROCESS FROM NODE 20530.00 TO NODE 20531.00 IS CODE = 21
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
______
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                              SUBAREA AREA (ACRES) = 21.08 SUBAREA RUNOFF (CFS) = 35.88
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
                                                                              EFFECTIVE AREA(ACRES) = 26.41 AREA-AVERAGED Fm(INCH/HR) = 0.58
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 818.88
                                                                              TOTAL AREA (ACRES) = 26.4 PEAK FLOW RATE (CFS) =
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1470.00
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.549
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.925
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA TC AND LOSS RATE DATA (AMC II):
                                                                              DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.19
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Ap SCS Tc
                                                                              FLOW VELOCITY (FEET/SEC.) = 3.11 DEPTH*VELOCITY (FT*FT/SEC.) = 2.06
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
                                                                              *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 RESIDENTIAL
                                                                                   AND L = 771.1 FT WITH ELEVATION-DROP = 5.0 FT, IS 41.1 CFS,
 "3-4 DWELLINGS/ACRE" A 5.33 0.98 0.600 32 14.55
                                                                                   WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20532.00
                                                                              LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20532.00 = 1590.01 FEET.
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                            ******************
 SUBAREA RUNOFF(CFS) = 11.22
 TOTAL AREA (ACRES) = 5.33 PEAK FLOW RATE (CFS) = 11.22
                                                                              FLOW PROCESS FROM NODE 20532.00 TO NODE 20533.00 IS CODE = 42
                                                                            _______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                            _____
******************
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1465.00
 FLOW PROCESS FROM NODE 20531.00 TO NODE 20532.00 IS CODE = 63
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1455.00
...........
                                                                              FLOW LENGTH (FEET) = 1024.14 MANNING'S N = 0.013
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
_____
                                                                              DEPTH OF FLOW IN 33.0 INCH PIPE IS 23.6 INCHES
 UPSTREAM ELEVATION(FEET) = 1470.00 DOWNSTREAM ELEVATION(FEET) = 1465.00
                                                                              PIPE-FLOW VELOCITY (FEET/SEC.) = 9.89
 STREET LENGTH (FEET) = 771.13 CURB HEIGHT (INCHES) = 6.0
                                                                              PIPE-FLOW(CFS) =
```

Page 23

Date: 04/21/2014

File name: LR020577.RFS

Date: 04/21/2014 File name: LR0205ZZ.RES Page 24

29.29

SCS

44.95

```
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.73 Tc (MIN.) = 20.93
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20533.00 = 2614.15 FEET.
*****************
 FLOW PROCESS FROM NODE 20533.00 TO NODE 20533.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 20.93
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.351
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                    Fp
                                                      SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SCHOOL
                      A 1.18 0.98
                                             0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                             1.68 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 2.86
                              SUBAREA RUNOFF (CFS) = 4.55
 EFFECTIVE AREA(ACRES) = 29.27 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 29.3
                              PEAK FLOW RATE(CFS) =
                                                       46.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 20533.00 TO NODE 20534.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1455.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 1374.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.82
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.16
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.39
 STREET FLOW TRAVEL TIME (MIN.) = 4.44 Tc (MIN.) = 25.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.095
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                      A
 "3-4 DWELLINGS/ACRE"
                              3.88
                                         0.98
                                                 0.600
                                                         32
 SCHOOL
                       A
                              34.43 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 38.31
                               SUBAREA RUNOFF (CFS) = 52.07
 EFFECTIVE AREA(ACRES) = 67.58 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 67.6
                                PEAK FLOW RATE(CFS) =
                                                          91.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.71 HALFSTREET FLOOD WIDTH (FEET) = 28.27
 FLOW VELOCITY (FEET/SEC.) = 5.50 DEPTH*VELOCITY (FT*FT/SEC.) = 3.88
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 22.5 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.78
 PIPE-FLOW(CFS) =
                   46.53
 PIPEFLOW TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 22.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.229
 SUBAREA AREA (ACRES) = 38.31 SUBAREA RUNOFF (CFS) = 56.70
 TOTAL AREA(ACRES) = 67.6 PEAK FLOW RATE(CFS) = 100.02
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 53.48
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.96
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.84
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20534.00 = 3988.18 FEET.
********************
 FLOW PROCESS FROM NODE 20534.00 TO NODE 20535.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1396.00
 STREET LENGTH (FEET) = 1929.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
```

File name: LR020577.RFS

Page 26

Date: 04/21/2014

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.52
 STREET FLOW TRAVEL TIME (MIN.) = 5.51 Tc (MIN.) = 28.39
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.958
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
     LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                               35.20
                                         0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 35.20
                             SUBAREA RUNOFF (CFS) = 43.51
 EFFECTIVE AREA(ACRES) = 102.78 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 127.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.29
 FLOW VELOCITY (FEET/SEC.) = 5.88 DEPTH*VELOCITY (FT*FT/SEC.) = 4.62
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.22
 PIPE-FLOW(CFS) = 50.19
 PIPEFLOW TRAVEL TIME (MIN.) = 3.15 Tc (MIN.) = 26.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.063
 SUBAREA AREA(ACRES) = 35.20 SUBAREA RUNOFF(CFS) = 46.84
 TOTAL AREA(ACRES) = 102.8
                                PEAK FLOW RATE (CFS) = 136.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.72
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20535.00 = 5917.68 FEET.
*****************
 FLOW PROCESS FROM NODE 20535.00 TO NODE 20536.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1396.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
```

```
FLOW LENGTH (FEET) = 1300.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 3.83
 PIPE-FLOW(CFS) = 108.29
 PIPEFLOW TRAVEL TIME (MIN.) = 5.66 Tc (MIN.) = 31.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.833
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 12.27
                                          0.98 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 12.67 SUBAREA RUNOFF (CFS) = 14.29
 EFFECTIVE AREA(ACRES) = 115.45 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 115.4
                                   PEAK FLOW RATE (CFS) = 136.76
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 28.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.83
   HALFSTREET FLOOD WIDTH (FEET) = 34.36
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.01
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20536.00 = 7218.31 FEET.
******************
 FLOW PROCESS FROM NODE 20536.00 TO NODE 20536.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 31.69
 RAINFALL INTENSITY (INCH/HR) = 1.83
 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.97
```

Page 28

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE AREA-AVERAGED Ap = 0.60EFFECTIVE STREAM AREA(ACRES) = 115.45 TOTAL STREAM AREA(ACRES) = 115.45 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): PEAK FLOW RATE (CFS) AT CONFLUENCE = 136.76 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 444.41 29.87 1.900 0.86(0.49) 0.57 347.1 20510.00 377.5 20500.00 1 341.60 44.84 1.489 0.86(0.49) 0.57 136.76 31.69 1.833 0.97(0.58) 0.60 115.4 20530.00 2 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 580.15 29.87 1.900 0.89(0.51) 0.57 455.9 20510.00 568.66 31.69 1.833 0.89(0.51) 0.58 466.2 20530.00 2 3 440.61 44.84 1.489 0.89(0.51)0.57 493.0 20500.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 580.15 Tc (MIN.) = 29.87 EFFECTIVE AREA(ACRES) = 455.88 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.57 TOTAL AREA (ACRES) = 493.0 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET. FLOW PROCESS FROM NODE 20536.00 TO NODE 20537.00 IS CODE = 33 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << \_\_\_\_\_ BOX-FLOW(CFS) = 580.15UPSTREAM NODE ELEVATION (FEET) = 1395.00 DOWNSTREAM NODE ELEVATION (FEET) = 1394.50 FLOW LENGTH (FEET) = 877.02 MANNING'S N = 0.013USER SPECIFIED PIPE DIAMETER (INCH) = 144.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 144.0 INCH PIPE IS 107.2 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 6.43PIPE-FLOW(CFS) = 580.15\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* MAINLINE Tc(MIN.) = 33.22PIPEFLOW TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 32.32 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.812 SUBAREA LOSS RATE DATA (AMC II): SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL RESIDENTIAL "3-4 DWELLINGS/ACRE" В 13.40 0.75 0.600 56 RESIDENTIAL В 8.54 0.600 56 "3-4 DWELLINGS/ACRE" SCHOOL 0.75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 COMMERCIAL В SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 В PUBLIC PARK SUBAREA AREA (ACRES) = 21.94 SUBAREA RUNOFF (CFS) = 26.92 SCHOOL EFFECTIVE AREA(ACRES) = 477.82 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.58 TOTAL AREA(ACRES) = 514.9 PEAK FLOW RATE(CFS) = 580.15

Page 29

Date: 04/21/2014

File name: LR0205ZZ.RES

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50STREET CROSS-SECTION INFORMATION: CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 \*NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW; STREET HYDRAULICS NOT COMPUTED\* \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 877.0 FT WITH ELEVATION-DROP = 0.5 FT, IS 30.5 CFS, WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20537.00 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20537.00 = 13124.98 FEET. \* FLOW PROCESS FROM NODE 20537.00 TO NODE 20538.00 IS CODE = 48 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>> \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1394.00 DOWNSTREAM(FEET) = 1380.00 FLOW LENGTH (FEET) = 851.83 MANNING'S N = 0.014 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 4.00 \*GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 9.26 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.67 BOX-FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 33.22LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20538.00 = 13976.81 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20538.00 TO NODE 20538.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.782 DEVELOPMENT TYPE/ SCS SOIL AREA Fp αA SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN "5-7 DWELLINGS/ACRE" B 6.57 0.75 0.500 56 B 9.02 0.75 0.600 56 6.87 0.75 0.100 56 0.38 0.75 0.850 56 0.45 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.428 SUBAREA AREA(ACRES) = 23.29 SUBAREA RUNOFF(CFS) = 30.64 Date: 04/21/2014 File name: LR0205ZZ.RES Page 30

```
EFFECTIVE AREA(ACRES) = 501.11 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 538.2
                           PEAK FLOW RATE(CFS) = 580.15
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20538.00 TO NODE 20539.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1366.00
 FLOW LENGTH (FEET) = 1281.91 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 7.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 10.99
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 13.20
 BOX-FLOW(CFS) = 580.15
 BOX-FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 34.84
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 34.84
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.732
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fρ
                                         Ар
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                           0.02
                                   0.75
                                          0.600 56
 COMMERCIAL
                     В
                            3.73
                                   0.75
                                          0.100
                                                 56
                     В
                                          0.850
 PUBLIC PARK
                           1.42
                                   0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.308
 SUBAREA AREA(ACRES) = 5.17
                           SUBAREA RUNOFF (CFS) = 6.99
 EFFECTIVE AREA(ACRES) = 506.28 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) =
                  543.4
                           PEAK FLOW RATE (CFS) = 580.15
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
```

```
_____
 PEAK FLOWRATE TABLE FILE NAME: 20454.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4010.20 Tc (MIN.) = 46.04
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA (ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4010.20 Tc (MIN.) = 46.04
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA (ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<<
______
************************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20539.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1395.00 DOWNSTREAM(FEET) = 1366.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1483.64 CHANNEL SLOPE = 0.0195
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 4010.20
 FLOW VELOCITY (FEET/SEC.) = 31.67 FLOW DEPTH (FEET) = 5.50
 TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 46.82
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
*****************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 46.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.451
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                              SCS
                                 Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 PUBLIC PARK
                    В
                           2.13
                                  0.75
                                        0.850
 SCHOOL
                    В
                          8.75
                                  0.75
                                        0.600
                                               56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                          3.67
                                  0.75
                                        0.600
                                               56
 COMMERCIAL
                    В
                          0.11
                                  0.75
                                        0.100
                                               56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                          0.07
                                  0.75
                                        0.500
                                             56
      Date: 04/21/2014
                   File name: LR0205ZZ.RES
                                             Page 32
```

```
4.39
 MOBILE HOME PARK
                         В
                                        0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.544
 SUBAREA AREA(ACRES) = 19.12
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.22;3H= 2.04;6H= 2.82;24H= 6.77
 S-GRAPH: VALLEY(DEV.) = 63.1%; VALLEY(UNDEV.) / DESERT= 36.9%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.78; LAG(HR) = 0.62; Fm(INCH/HR) = 0.55; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;
 3HR = 0.96; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5454.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232; Lca/L=0.6,n=.0217
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1512.82
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3880.09
 TOTAL AREA(ACRES) = 5454.9
                                PEAK FLOW RATE (CFS) = 4010.20
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 4010.20
                                 Tc(MIN.) = 46.82
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA (ACRES) = 5454.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
  ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           0
                  Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
    1
           580.15 34.84 1.732 0.88(0.50) 0.57
                                                  506.3 20510.00
     2
           568.66 36.67 1.680 0.88(0.50) 0.57
                                                  516.6 20530.00
           447.09 50.02 1.394 0.88( 0.50) 0.57 543.4 20500.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.45;30M= 0.93;1H= 1.23;3H= 2.04;6H= 2.81;24H= 6.67
 S-GRAPH: VALLEY (DEV.) = 66.4%; VALLEY (UNDEV.) / DESERT= 33.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.78; LAG(HR) = 0.62; Fm(INCH/HR) = 0.55; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.76; 30M = 0.76; 1HR = 0.76;
 3HR = 0.96; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232; Lca/L=0.6,n=.0217
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1633.12
```

File name: LR020577.RFS

Page 33

Date: 04/21/2014

```
PEAK FLOW RATE(CFS) = 4219.05
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12
>>>>CLEAR MEMORY BANK # 1 <<<<<
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 152
>>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<
 PEAK FLOWRATE TABLE FILE NAME: 20539.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 5998.3 TC(MIN.) =
                               46.82
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 PEAK FLOW RATE (CFS) = 4219.05
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20658

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0206ZZ.DAT

30.0

39.0

11 24.0

12 24.0

13 32.0

15.0

15.0

15.0

20.0

Date: 04/21/2014

10

14

TIME/DATE OF STUDY: 08:19 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

> 0.67 0.67 2.00 0.0312 0.167 0.0180 20.0 0.020/0.020/0.020 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

0.50

0.67

15 36.0 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

0.020/0.020/0.020 0.67

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

File name: LR020677.RFS Page 1

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

17 20.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 10.0 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

## GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.20 FEET

as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN

OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF

1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH

FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE.

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20600.00 TO NODE 20601.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 667.14

ELEVATION DATA: UPSTREAM(FEET) = 2277.00 DOWNSTREAM(FEET) = 2175.00

\_\_\_\_\_

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.086

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.161

SUBAREA TO AND LOSS RATE DATA (AMC II):

DODUMEN IC WIND HODD WATE	DUIV (VIIC	· ++/•				
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Аp	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	В	0.56	0.75	0.600	56	8.09
RESIDENTIAL						
"2 DWELLINGS/ACRE"	В	5.26	0.75	0.700	56	8.60
NATURAL FAIR COVER						
"OPEN BRUSH"	В	0.30	0.61	1.000	66	13.86
CUDADEA AUEDACE DEDUITOU		D D (T)	arr / rrp \	7.4		

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.706

SUBAREA RUNOFF(CFS) = 20.05

TOTAL AREA (ACRES) = 6.12 PEAK FLOW RATE (CFS) = 20.05

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50

FLOW PROCESS FROM NODE 20601.00 TO NODE 20602.00 IS CODE = 54

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

\_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 2175.00 DOWNSTREAM(FEET) = 2160.00

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 204.73 CHANNEL SLOPE = 0.0733
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.94 FLOW DEPTH (FEET) = 0.58
 TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 8.95
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20602.00 = 871.87 FEET.
FLOW PROCESS FROM NODE 20602.00 TO NODE 20602.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 8.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.914
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                             Aр
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             0.68
                                      0.75
                                             0.700
                                                   56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.18
                                      0.75
                                             0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
 SUBAREA AREA(ACRES) = 0.86
                            SUBAREA RUNOFF (CFS) = 2.65
 EFFECTIVE AREA(ACRES) = 6.98 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 7.0 PEAK FLOW RATE (CFS) =
                                                    21.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20602.00 TO NODE 20603.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2145.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.43 CHANNEL SLOPE = 0.0559
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              21.34
 FLOW VELOCITY (FEET/SEC.) = 3.60 FLOW DEPTH (FEET) = 0.63
 TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 10.19
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20603.00 = 1140.30 FEET.
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20603.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 10.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.621
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                   B 1.70 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 1.70 SUBAREA RUNOFF (CFS) = 4.74
 EFFECTIVE AREA(ACRES) = 8.68 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 8.7 PEAK FLOW RATE (CFS) = 24.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20604.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2145.00 DOWNSTREAM(FEET) = 2135.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 214.72 CHANNEL SLOPE = 0.0466
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 24.23
 FLOW VELOCITY (FEET/SEC.) = 3.47 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 11.22
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20604.00 = 1355.02 FEET.
*************************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20604.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.417
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                         Ар
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 1.97
                                    0.75
                                           0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.08
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 2.05 SUBAREA RUNOFF(CFS) = 5.34
 EFFECTIVE AREA(ACRES) = 10.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 10.7 PEAK FLOW RATE (CFS) =
                                                 27.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20605.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2135.00 DOWNSTREAM(FEET) = 2125.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 174.03 CHANNEL SLOPE = 0.0575
```

Date: 04/21/2014 File name: LR020677.RFS

Page 4

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            27.99
 FLOW VELOCITY (FEET/SEC.) = 3.90 FLOW DEPTH (FEET) = 0.69
 TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 11.97
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20605.00 = 1529.05 FEET.
******************
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20605.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 11.97
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.288
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                          Ар
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 2.05
                                    0.75
                                           0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10
                                    0.75
                                          0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA AREA(ACRES) = 2.15
                           SUBAREA RUNOFF (CFS) = 5.36
 EFFECTIVE AREA(ACRES) = 12.88 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.9
                           PEAK FLOW RATE(CFS) =
                                                  32.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
*****
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20606.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2115.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 235.99 CHANNEL SLOPE = 0.0424
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             32.10
 FLOW VELOCITY (FEET/SEC.) = 3.58 FLOW DEPTH (FEET) = 0.77
 TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 13.07
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20606.00 = 1765.04 FEET.
******************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20606.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 13.07
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.120
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           αA
                                                 SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                            3.11
                                    0.75
                                           0.700 56
```

```
"3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) = 7.79
 EFFECTIVE AREA(ACRES) = 16.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.2
                              PEAK FLOW RATE(CFS) =
                                                    37.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20607.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2115.00 DOWNSTREAM(FEET) = 2092.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 277.39 CHANNEL SLOPE = 0.0829
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             37.94
 FLOW VELOCITY (FEET/SEC.) = 4.85 FLOW DEPTH (FEET) = 0.72
 TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 14.02
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20607.00 = 2042.43 FEET.
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20607.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.991
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.41
                                     0.75
                                            0.700
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.659
 SUBAREA AREA(ACRES) = 0.70
                             SUBAREA RUNOFF (CFS) = 1.57
 EFFECTIVE AREA(ACRES) = 16.91 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.9
                              PEAK FLOW RATE (CFS) =
                                                   37.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20608.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
```

Page 6

RESIDENTIAL

```
ELEVATION DATA: UPSTREAM(FEET) = 2092.00 DOWNSTREAM(FEET) = 2080.00
                                                                                                  В 5.77
                                                                                                                 0.75
                                                                                                                         0.100
                                                                            COMMERCIAL
                                                                                                                                56
 CHANNEL LENGTH THRU SUBAREA (FEET) = 203.75 CHANNEL SLOPE = 0.0589
                                                                            RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  B 7.52
                                                                                                                 0.75
                                                                                                                         0.700
                                                                                                                                56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                            RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.91
                                                                                                                 0.75
                                                                                                                         0.600
                               37.94
                                                                                                  В
                                                                                                         1.23
 FLOW VELOCITY (FEET/SEC.) = 4.23 FLOW DEPTH (FEET) = 0.77
                                                                            MOBILE HOME PARK
                                                                                                                 0.75
                                                                                                                         0.250
                                                                                                                                56
 TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 14.82
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE" B 0.92
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20608.00 = 2246.18 FEET.
                                                                                                                 0.75 0.900
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
************************
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.460
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20608.00 IS CODE = 81
                                                                            SUBAREA AREA (ACRES) = 16.35 SUBAREA RUNOFF (CFS) = 35.08
                                                                            EFFECTIVE AREA(ACRES) = 38.51 AREA-AVERAGED Fm(INCH/HR) = 0.44
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
_____
                                                                            TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) =
                                                                                                                                79.29
 MAINLINE Tc(MIN.) = 14.82
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.892
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA(AMC II):
                                                                            5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                              Αp
                                   Fр
                                                    SCS
                                                                           ******************
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                            FLOW PROCESS FROM NODE 20609.00 TO NODE 20610.00 IS CODE = 63
 "2 DWELLINGS/ACRE"
                    В
                            2.94
                                      0.75
                                             0.700
                                                   56
 RESIDENTIAL
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 "3-4 DWELLINGS/ACRE" B
                            2.31 0.75
                                             0.600 56
                                                                            >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.656
                                                                            UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
 SUBAREA AREA (ACRES) = 5.25 SUBAREA RUNOFF (CFS) = 11.35
                                                                            STREET LENGTH (FEET) = 360.92 CURB HEIGHT (INCHES) = 6.0
 EFFECTIVE AREA(ACRES) = 22.16 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                            STREET HALFWIDTH (FEET) = 18.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 22.2 PEAK FLOW RATE(CFS) = 47.48
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
*****************
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20609.00 IS CODE = 54
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
______
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2065.00
                                                                              ***STREET FLOWING FULL***
 CHANNEL LENGTH THRU SUBAREA (FEET) = 358.70 CHANNEL SLOPE = 0.0418
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                              STREET FLOW DEPTH (FEET) = 0.72
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 28.94
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              47.48
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.87
 FLOW VELOCITY (FEET/SEC.) = 3.95 FLOW DEPTH (FEET) = 0.90
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.50
 TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 16.34
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 17.57
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20609.00 = 2604.88 FEET.
                                                                            * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.612
                                                                            SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fp
                                                                                                                         Αр
 FLOW PROCESS FROM NODE 20609.00 TO NODE 20609.00 IS CODE = 81
                                                                                LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            RESIDENTIAL
                                                                            "5-7 DWELLINGS/ACRE"
                                                                                                В 1.29
                                                                                                                 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                                                         0.500
                                                                                                                                56
______
                                                                            COMMERCIAL
                                                                                                в 2.79
                                                                                                                 0.75
                                                                                                                         0.100
                                                                                                                                56
 MAINLINE Tc(MIN.) = 16.34
                                                                            RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.728
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                         0.24
                                                                                                                  0.75
                                                                                                                         0.600
                                                                                                                                56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                           Ар
                                                    SCS
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.95
                                                                                                                  0.75
                                                                                                                         0.700
                                                                                                                                56
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            MOBILE HOME PARK
                                                                                                  В
                                                                                                         0.22
                                                                                                                 0.75
                                                                                                                         0.250
       Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                  Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                                                               Page 8
```

Page 7

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 SUBAREA AREA(ACRES) = 5.49 SUBAREA RUNOFF(CFS) = 11.70
 EFFECTIVE AREA(ACRES) = 44.00 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 44.0 PEAK FLOW RATE (CFS) =
                                                           86.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.18
 FLOW VELOCITY (FEET/SEC.) = 4.89 DEPTH*VELOCITY (FT*FT/SEC.) = 3.54
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20610.00 = 2965.80 FEET.
*****************
 FLOW PROCESS FROM NODE 20610.00 TO NODE 20611.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2057.00
 STREET LENGTH (FEET) = 352.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.83
   HALFSTREET FLOOD WIDTH (FEET) = 34.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.51
 STREET FLOW TRAVEL TIME (MIN.) = 1.38 Tc (MIN.) = 18.95
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.496
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     в 0.30
                                                  0.500
                                                        56
                                          0.75
                                1.71
 COMMERCIAL
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                                1.66
                                          0.75
                                                  0.400
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                               1.04
                                          0.75
                                                  0.600
                                                        56
 RESIDENTIAL
                       В
                               12.96
                                          0.75
                                                  0.700
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
```

File name: LR0206ZZ.RES

Page 9

Date: 04/21/2014

```
EFFECTIVE AREA (ACRES) = 61.67 AREA-AVERAGED Fm (INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 61.7
                                 PEAK FLOW RATE (CFS) = 114.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.77
 FLOW VELOCITY (FEET/SEC.) = 4.36 DEPTH*VELOCITY (FT*FT/SEC.) = 3.73
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 352.2 FT WITH ELEVATION-DROP = 3.0 FT, IS 58.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20611.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20611.00 = 3318.05 FEET.
*******************
 FLOW PROCESS FROM NODE 20611.00 TO NODE 20612.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2057.00 DOWNSTREAM ELEVATION(FEET) = 2054.00
 STREET LENGTH(FEET) = 398.28 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   154.80
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.97
   HALFSTREET FLOOD WIDTH (FEET) = 41.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.30
 STREET FLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 20.45
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.385
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                 αA
                                                          SCS
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       B 0.48
                                          0.75
                                                  0.500
                                                          56
 COMMERCIAL
                         B 2.00
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                         В 37.07
                                          0.75
                                                  0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                                 6.98
                                          0.75
                                                  0.600
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                         B
                                 0.01
                                          0.75
                                                  0.400
                                                          56
 NATURAL FAIR COVER
       Date: 04/21/2014
                         File name: LR0206ZZ.RES
                                                        Page 10
```

SUBAREA AREA (ACRES) = 17.67 SUBAREA RUNOFF (CFS) = 32.50

```
"OPEN BRUSH"
                       В
                               0.36 0.61 1.000 66
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.660
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA (ACRES) = 46.90 SUBAREA RUNOFF (CFS) = 79.87
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 EFFECTIVE AREA(ACRES) = 108.57 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
                                                                                       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                        200.62
 TOTAL AREA (ACRES) = 108.6 PEAK FLOW RATE (CFS) = 188.57
                                                                                       ***STREET FLOWING FULL***
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       STREET FLOW DEPTH(FEET) = 0.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 42.49
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.39
 DEPTH(FEET) = 1.03 HALFSTREET FLOOD WIDTH(FEET) = 44.62
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 20.46
 FLOW VELOCITY (FEET/SEC.) = 4.65 DEPTH*VELOCITY (FT*FT/SEC.) = 4.80
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.384
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                           Fр
                                                                                                                                     αA
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                         LAND USE
                                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                     RESIDENTIAL
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                     "5-7 DWELLINGS/ACRE"
                                                                                                          B 0.53
                                                                                                                              0.75
                                                                                                                                       0.500
                                                                                                             B 2.00
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
                                                                                     COMMERCIAL
                                                                                                                              0.75
                                                                                                                                       0.100
 ASSUME FULL-FLOWING PIPELINE
                                                                                     RESIDENTIAL
                                                                                                          в 1.58
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.38
                                                                                     "2 DWELLINGS/ACRE"
                                                                                                                              0.75
                                                                                                                                       0.700
 PIPE-FLOW(CFS) = 85.38
                                                                                     RESIDENTIAL
                                                                                     "3-4 DWELLINGS/ACRE" B 0.26
                                                                                                                              0.75 0.600
 PIPEFLOW TRAVEL TIME (MIN.) = 0.38 Tc (MIN.) = 19.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.466
                                                                                     SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AREA (ACRES) = 46.90 SUBAREA RUNOFF (CFS) = 83.30
                                                                                     SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
 TOTAL AREA (ACRES) = 108.6 PEAK FLOW RATE (CFS) = 196.51
                                                                                     SUBAREA AREA(ACRES) = 4.37 SUBAREA RUNOFF(CFS) = 8.21
                                                                                     EFFECTIVE AREA(ACRES) = 112.94 AREA-AVERAGED Fm(INCH/HR) = 0.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                                     TOTAL AREA(ACRES) = 112.9 PEAK FLOW RATE(CFS) =
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 111.13
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
   ***STREET FLOWING FULL***
                                                                                     5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
   HALFSTREET FLOOD WIDTH (FEET) = 36.20
                                                                                     DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 42.18
                                                                                     FLOW VELOCITY (FEET/SEC.) = 5.42 DEPTH*VELOCITY (FT*FT/SEC.) = 5.33
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.56
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       AND L = 398.3 FT WITH ELEVATION-DROP = 3.0 FT, IS 145.4 CFS,
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20612.00
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20612.00 = 3716.33 FEET.
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
******************
                                                                                     ASSUME FULL-FLOWING PIPELINE
 FLOW PROCESS FROM NODE 20612.00 TO NODE 20613.00 IS CODE = 63
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 20.92
______
                                                                                     PIPE-FLOW(CFS) = 102.79
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 19.63
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.444
_____
                                                                                     SUBAREA AREA (ACRES) = 4.37 SUBAREA RUNOFF (CFS) = 8.45
 UPSTREAM ELEVATION(FEET) = 2054.00 DOWNSTREAM ELEVATION(FEET) = 2050.00
                                                                                     TOTAL AREA (ACRES) = 112.9 PEAK FLOW RATE (CFS) = 202.80
 STREET LENGTH (FEET) = 366.37 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 100.02
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                       ***STREET FLOWING FULL***
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                       STREET FLOW DEPTH (FEET) = 0.79
```

Page 11

Date: 04/21/2014

File name: LR0206ZZ.RES

Date: 04/21/2014

File name: LR0206ZZ.RES

SCS

56

56

56

Page 12

```
HALFSTREET FLOOD WIDTH (FEET) = 32.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.64
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20613.00 = 4082.70 FEET.
FLOW PROCESS FROM NODE 20613.00 TO NODE 20614.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2050.00 DOWNSTREAM ELEVATION(FEET) = 2047.00
 STREET LENGTH (FEET) = 389.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 208.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.06
   HALFSTREET FLOOD WIDTH (FEET) = 46.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.79
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.10
 STREET FLOW TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 20.98
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.348
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     ďΨ
                                                αA
                                                       SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                    В
 "5-7 DWELLINGS/ACRE"
                               0.63
                                        0.75
                                                0.500
                                                      56
                      В
                               2.36
                                        0.75
                                                0.100
                                                      56
 COMMERCIAL
 RESIDENTIAL
                               0.24
                                        0.75
                                                0.600
                                                      56
 "3-4 DWELLINGS/ACRE"
                    В
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                              2.47
                                      0.75
                                                0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
 SUBAREA AREA(ACRES) = 5.70 SUBAREA RUNOFF(CFS) = 10.41
 EFFECTIVE AREA(ACRES) = 118.64 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 118.6 PEAK FLOW RATE (CFS) = 203.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.06 HALFSTREET FLOOD WIDTH(FEET) = 45.78
 FLOW VELOCITY (FEET/SEC.) = 4.77 DEPTH*VELOCITY (FT*FT/SEC.) = 5.04
```

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.72
 PIPE-FLOW(CFS) = 111.29
 PIPEFLOW TRAVEL TIME (MIN.) = 0.35 Tc (MIN.) = 19.97
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.418
 SUBAREA AREA (ACRES) = 5.70 SUBAREA RUNOFF (CFS) = 10.77
 TOTAL AREA (ACRES) = 118.6 PEAK FLOW RATE (CFS) = 210.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 99.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.83
   HALFSTREET FLOOD WIDTH (FEET) = 34.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.37
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20614.00 = 4472.43 FEET.
*******************
 FLOW PROCESS FROM NODE 20614.00 TO NODE 20615.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 2047.00 DOWNSTREAM ELEVATION (FEET) = 2044.00
 STREET LENGTH (FEET) = 324.66 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.04
   HALFSTREET FLOOD WIDTH (FEET) = 45.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.42
 STREET FLOW TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 21.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.346
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 14

```
B 0.61
B 1.87
 "5-7 DWELLINGS/ACRE"
                                          0.75
                                                  0.500
                                                          56
 COMMERCIAL
                                          0.75
                                                   0.100
                                                         56
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 RESIDENTIAL
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE"
                               0.40
                                          0.75
                                                  0.600
                                                         56
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 RESIDENTIAL
                       B 2.63 0.75 0.700 56
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.467
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SUBAREA AREA (ACRES) = 5.51 SUBAREA RUNOFF (CFS) = 9.90
                                                                                      ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 124.15 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                                      STREET FLOW DEPTH (FEET) = 1.14
 TOTAL AREA (ACRES) = 124.1 PEAK FLOW RATE (CFS) = 213.10
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 50.06
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.15
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 21.42
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.319
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 1.04 HALFSTREET FLOOD WIDTH(FEET) = 44.99
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                             Fρ
 FLOW VELOCITY (FEET/SEC.) = 5.17 DEPTH*VELOCITY (FT*FT/SEC.) = 5.38
                                                                                         LAND USE
                                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     RESIDENTIAL
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                     "5-7 DWELLINGS/ACRE"
                                                                                                          В
                                                                                                                     2.51
                                                                                                                              0.75
                                                                                                                                      0.500
                                                                                                                                              56
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     COMMERCIAL
                                                                                                          В 0.24
                                                                                                                              0.75
                                                                                                                                      0.100
                                                                                                                                              56
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                     RESIDENTIAL
                                                                                     "3-4 DWELLINGS/ACRE" B 2.23
                                                                                                                              0.75
                                                                                                                                      0.600
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
                                                                                     RESIDENTIAL
                                                                                     "2 DWELLINGS/ACRE"
                                                                                                           B 7.57 0.75 0.700
                                                                                                                                              56
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 20.51
                                                                                     SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PIPE-FLOW(CFS) = 121.93
                                                                                     SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.631
 PIPEFLOW TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 20.24
                                                                                     SUBAREA AREA (ACRES) = 12.55 SUBAREA RUNOFF (CFS) = 20.86
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.399
                                                                                     EFFECTIVE AREA(ACRES) = 136.70 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AREA(ACRES) = 5.51 SUBAREA RUNOFF(CFS) = 10.17
                                                                                     AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 124.1 PEAK FLOW RATE (CFS) = 219.12
                                                                                     TOTAL AREA (ACRES) = 136.7 PEAK FLOW RATE (CFS) =
                                                                                                                                              231.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                                     5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 97.19
   ***STREET FLOWING FULL***
                                                                                     DEPTH(FEET) = 1.14 HALFSTREET FLOOD WIDTH(FEET) = 50.24
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     FLOW VELOCITY (FEET/SEC.) = 4.51 DEPTH*VELOCITY (FT*FT/SEC.) = 5.16
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.97
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.33
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.46
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20615.00 = 4797.09 FEET.
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
*******************
                                                                                     ASSUME FULL-FLOWING PIPELINE
 FLOW PROCESS FROM NODE 20615.00 TO NODE 20616.00 IS CODE = 63
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 17.87
______
                                                                                     PIPE-FLOW(CFS) = 126.46
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 20.54
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.378
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                     SUBAREA AREA (ACRES) = 12.55 SUBAREA RUNOFF (CFS) = 21.53
                                                                                     TOTAL AREA (ACRES) = 136.7 PEAK FLOW RATE (CFS) = 238.31
 UPSTREAM ELEVATION(FEET) = 2044.00 DOWNSTREAM ELEVATION(FEET) = 2042.00
 STREET LENGTH (FEET) = 320.06 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 111.85
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      ***STREET FLOWING FULL***
```

Date: 04/21/2014

File name: LR0206ZZ.RES

Page 15

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.89
  HALFSTREET FLOOD WIDTH (FEET) = 37.67
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.84
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.43
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20616.00 = 5117.15 FEET.
*******************
 FLOW PROCESS FROM NODE 20616.00 TO NODE 20648.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 2042.00 DOWNSTREAM ELEVATION(FEET) = 2025.00
 STREET LENGTH (FEET) = 522.92 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 245.13
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.88
  HALFSTREET FLOOD WIDTH (FEET) = 37.06
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.69
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.66
 STREET FLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 21.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.311
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  αA
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                               2.43
                                          0.75
                                                  0.500
                        В
                                2.02
                                          0.75
                                                        56
 COMMERCIAL
                                                  0.100
 RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                      В 3.04
                                         0.75
                                                  0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.27
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.478
                               SUBAREA RUNOFF(CFS) = 13.65
 SUBAREA AREA (ACRES) = 7.76
 EFFECTIVE AREA(ACRES) = 144.46 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 144.5 PEAK FLOW RATE (CFS) = 243.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 36.99
```

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 33.65
 PIPE-FLOW(CFS) = 133.92
 PIPEFLOW TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 20.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.361
 SUBAREA AREA (ACRES) = 7.76 SUBAREA RUNOFF (CFS) = 13.99
 TOTAL AREA (ACRES) = 144.5 PEAK FLOW RATE (CFS) = 250.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 116.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.02
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5640.07 FEET.
******************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20620.00 TO NODE 20621.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 866.66
 ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2160.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.083
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.270
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Aр
                                                     SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
    LAND USE
 NATURAL FAIR COVER
                     B 11.35
 "OPEN BRUSH"
                                      0.61 1.000
                                                      66 20.71
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89 0.75 0.600
                                                     56 12.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.971
 SUBAREA RUNOFF (CFS) = 29.39
 TOTAL AREA(ACRES) = 12.24 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

File name: LR0206ZZ.RES

Page 18

Date: 04/21/2014

FLOW VELOCITY (FEET/SEC.) = 8.67 DEPTH\*VELOCITY (FT\*FT/SEC.) = 7.63

```
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.53
                                                                       ******************
                                                                         FLOW PROCESS FROM NODE 20623.00 TO NODE 20623.00 IS CODE = 81
******************
                                                                        ______
 FLOW PROCESS FROM NODE 20621.00 TO NODE 20622.00 IS CODE = 54
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                        ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         MAINLINE Tc (MIN.) = 15.45
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.821
______
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
                                                                         DEVELOPMENT TYPE/
                                                                                         SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                    Aр
                                                                                                                          SCS
 CHANNEL LENGTH THRU SUBAREA (FEET) = 356.13 CHANNEL SLOPE = 0.0281
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
                                                                         RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         "2 DWELLINGS/ACRE"
                                                                                                    3.20
                                                                                                                    0.700
                                                                                                            0.75
                                                                                                                           56
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              29.39
                                                                         NATURAL FAIR COVER
 FLOW VELOCITY (FEET/SEC.) = 2.46 FLOW DEPTH (FEET) = 0.58
                                                                         "OPEN BRUSH"
                                                                                                     0.56
                                                                                                                    1.000
                                                                                              B
                                                                                                             0.61
                                                                                                                           66
 TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 14.50
                                                                         RESIDENTIAL
                                                                                                             0.75
                                                                                                                    0.400
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20622.00 = 1222.79 FEET.
                                                                         "8-10 DWELLINGS/ACRE"
                                                                                              В
                                                                                                     1.58
                                                                                                                           56
                                                                         RESIDENTIAL
"3-4 DWELLINGS/ACRE"
                                                                                                     2.74
                                                                                                             0.75
                                                                                                                    0.600
                                                                                                                           56
 FLOW PROCESS FROM NODE 20622.00 TO NODE 20622.00 IS CODE = 81
                                                                         RESIDENTIAL
                                                                         ".4 DWELLING/ACRE"
______
                                                                                                     0.08
                                                                                                             0.75
                                                                                                                    0.900
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.631
 MAINLINE Tc(MIN.) = 14.50
                                                                         SUBAREA AREA(ACRES) = 8.16
                                                                                                    SUBAREA RUNOFF(CFS) = 17.32
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.931
                                                                         EFFECTIVE AREA(ACRES) = 27.32 AREA-AVERAGED Fm(INCH/HR) = 0.55
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.84
                                                                         TOTAL AREA(ACRES) = 27.3
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fρ
                                            Αр
                                                  SCS
                                                                                                     PEAK FLOW RATE(CFS) =
                                                                                                                           55.88
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "OPEN BRUSH"
                             3.73
                                           1.000
                                                                         5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                      В
                                    0.61
                                                 66
 RESIDENTIAL
                                                                        ******************
 "2 DWELLINGS/ACRE"
                            1.57
                                    0.75
                                            0.700
                                                   56
 RESIDENTIAL
                                                                         FLOW PROCESS FROM NODE 20623.00 TO NODE 20624.00 IS CODE = 54
 "3-4 DWELLINGS/ACRE"
                      В
                            1.62
                                    0.75
                                            0.600
                                                                        ______
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 SUBAREA AREA (ACRES) = 6.92
                            SUBAREA RUNOFF (CFS) = 14.80
                                                                        _____
 EFFECTIVE AREA(ACRES) = 19.16 AREA-AVERAGED Fm(INCH/HR) = 0.58
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2145.00 DOWNSTREAM(FEET) = 2140.00
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.92
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 251.47 CHANNEL SLOPE = 0.0199
 TOTAL AREA(ACRES) = 19.2
                             PEAK FLOW RATE(CFS) =
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
                                                   40.45
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) = 55.88
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                         FLOW VELOCITY (FEET/SEC.) = 2.52 FLOW DEPTH (FEET) = 0.80
                                                                         TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 17.12
******************
                                                                         LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20624.00 = 1632.76 FEET.
 FLOW PROCESS FROM NODE 20622.00 TO NODE 20623.00 IS CODE = 54
                                                                        ********************
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         FLOW PROCESS FROM NODE 20624.00 TO NODE 20624.00 IS CODE = 81
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2145.00
                                                                        _____
 CHANNEL LENGTH THRU SUBAREA (FEET) = 158.50 CHANNEL SLOPE = 0.0315
                                                                         MAINLINE Tc (MIN.) = 17.12
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.653
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                         DEVELOPMENT TYPE/
                                                                                           SCS SOIL AREA
                                                                                                           Fр
                              40.45
                                                                                                                    Aр
                                                                                                                          SCS
 FLOW VELOCITY (FEET/SEC.) = 2.77 FLOW DEPTH (FEET) = 0.65
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 15.45
                                                                         RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20623.00 = 1381.29 FEET.
                                                                         "8-10 DWELLINGS/ACRE"
                                                                                                     4.38
                                                                                                            0.75
                                                                                                                    0.400
                                                                                                                          56
                                                                         RESIDENTIAL
```

File name: LR0206ZZ.RES Page 20

Date: 04/21/2014

```
"3-4 DWELLINGS/ACRE"
                  в 5.30
                                    0.75 0.600 56
                                                                        UPSTREAM ELEVATION (FEET) = 2130.00 DOWNSTREAM ELEVATION (FEET) = 2116.00
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 1.08
                                    0.75 0.900 56
                                                                          STREET LENGTH (FEET) = 342.35 CURB HEIGHT (INCHES) = 6.0
 CONDOMINIUMS
                      В
                           0.14
                                     0.75
                                            0.350 56
                                                                          STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.546
                                                                          DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                            SUBAREA RUNOFF (CFS) = 22.02
 SUBAREA AREA(ACRES) = 10.90
                                                                          INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 EFFECTIVE AREA(ACRES) = 38.22 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 38.2
                           PEAK FLOW RATE (CFS) = 73.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43: 30M = 0.87: 1HR = 1.15: 3HR = 1.96: 6HR = 2.75: 24HR = 6.50
*****
 FLOW PROCESS FROM NODE 20624.00 TO NODE 20625.00 IS CODE = 54
______
                                                                           ***STREET FLOWING FULL***
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2140.00 DOWNSTREAM(FEET) = 2130.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 332.21 CHANNEL SLOPE = 0.0301
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             73.77
 FLOW VELOCITY (FEET/SEC.) = 3.14 FLOW DEPTH (FEET) = 0.82
 TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 18.88
                                                                             LAND USE
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20625.00 = 1964.97 FEET.
                                                                          RESIDENTIAL
******************
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE"
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20625.00 IS CODE = 81
                                                                          MOBILE HOME PARK
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          RESIDENTIAL
______
                                                                          ".4 DWELLING/ACRE"
 MAINLINE Tc(MIN.) = 18.88
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.502
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  ďΨ
                                                  SCS
                                          αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           5.47
                                     0.75 0.600 56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                    в 0.16 0.75
                                          0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
 SUBAREA AREA(ACRES) = 5.63
                          SUBAREA RUNOFF (CFS) = 10.42
 EFFECTIVE AREA(ACRES) = 43.85 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 43.9 PEAK FLOW RATE(CFS) =
                                                   78.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20626.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                          STREET HALFWIDTH (FEET) = 18.00
```

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 83.54 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.61HALFSTREET FLOOD WIDTH (FEET) = 23.32 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.19 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.36 STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 19.67 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.441 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN "8-10 DWELLINGS/ACRE" B 0.09 0.75 0.400 56 B 4.68 0.600 0.75 56 B 0.24 0.75 0.250 56 В 0.04 0.75 0.900 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582 SUBAREA AREA (ACRES) = 5.05 SUBAREA RUNOFF (CFS) = 9.12 EFFECTIVE AREA(ACRES) = 48.90 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.72 TOTAL AREA(ACRES) = 48.9 PEAK FLOW RATE(CFS) = 85.69 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.57 FLOW VELOCITY (FEET/SEC.) = 7.24 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.42 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20626.00 = 2307.32 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20626.00 TO NODE 20627.00 IS CODE = 63 ----->>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2116.00 DOWNSTREAM ELEVATION(FEET) = 2110.00 STREET LENGTH (FEET) = 424.67 CURB HEIGHT (INCHES) = 6.0 Date: 04/21/2014 File name: LR020677.RFS Page 22

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.30
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.61
 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 21.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.340
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.03
                                          0.75
                                                  0.400
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.50
                                          0.75
                                                  0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       В
                                1.53
                                         0.75
                                                  0.900 56
                                                  0.250 56
 MOBILE HOME PARK
                                0.07
                                         0.75
                                                0.100 56
 COMMERCIAL
                        B
                                0.09
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA (ACRES) = 4.22 SUBAREA RUNOFF (CFS) = 6.93
 EFFECTIVE AREA(ACRES) = 53.12 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 53.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.18
 FLOW VELOCITY (FEET/SEC.) = 4.97 DEPTH*VELOCITY (FT*FT/SEC.) = 3.59
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20627.00 = 2731.99 FEET.
******************
 FLOW PROCESS FROM NODE 20627.00 TO NODE 20628.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2110.00 DOWNSTREAM ELEVATION(FEET) = 2108.00
 STREET LENGTH (FEET) = 486.92 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

```
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   92.86
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 38.03
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.82
 STREET FLOW TRAVEL TIME (MIN.) = 2.59 Tc (MIN.) = 23.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.183
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 1.07
                                         0.75
                                                 0.400
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 2.66
                                         0.75
                                                 0.900
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В 1.65
                                         0.75 0.600
                                                         56
                                0.68
 COMMERCIAL
                        В
                                         0.75 0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.640
 SUBAREA AREA (ACRES) = 6.06 SUBAREA RUNOFF (CFS) = 9.30
 EFFECTIVE AREA(ACRES) = 59.18 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.71
 TOTAL AREA (ACRES) = 59.2 PEAK FLOW RATE (CFS) = 89.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 37.54
 FLOW VELOCITY (FEET/SEC.) = 3.11 DEPTH*VELOCITY (FT*FT/SEC.) = 2.77
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 486.9 FT WITH ELEVATION-DROP = 2.0 FT, IS 16.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20628.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20628.00 = 3218.91 FEET.
*******************
 FLOW PROCESS FROM NODE 20628.00 TO NODE 20629.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 2108.00 DOWNSTREAM ELEVATION (FEET) = 2103.00
 STREET LENGTH (FEET) = 256.63 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Page 24

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70HALFSTREET FLOOD WIDTH (FEET) = 28.14 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.67 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.99 STREET FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 24.44 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.143SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Aр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" B 0.98 0.75 0.400 56 RESIDENTIAL ".4 DWELLING/ACRE" В 0.92 0.75 0.900 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 3.13 0.75 0.600 0.27 0.100 56 COMMERCIAL В 0.75 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590 SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 8.12 EFFECTIVE AREA(ACRES) = 64.48 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.70 TOTAL AREA(ACRES) = 64.5 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.33 FLOW VELOCITY (FEET/SEC.) = 5.72 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.04 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20629.00 = 3475.54 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20629.00 TO NODE 20630.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2103.00 DOWNSTREAM ELEVATION(FEET) = 2097.00 STREET LENGTH (FEET) = 278.26 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.61
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.29
 STREET FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 25.21
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.103
 SUBAREA LOSS RATE DATA (AMC II):
                     SCS SOIL AREA
  DEVELOPMENT TYPE/
                                         Fρ
                                                         SCS
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                 2.76
                                          0.75
                                                  0.350
 CONDOMINIUMS
                       В
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                       в 0.90
                                          0.75
                                                  0.400
                                                          56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 1.30
                                          0.75
                                                  0.900
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.80
                                          0.75
                                                  0.600
                                                          56
                                                  0.100
 COMMERCIAL
                         В
                               1.62
                                         0.75
                                                         56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.446
 SUBAREA AREA(ACRES) = 8.38
                                SUBAREA RUNOFF(CFS) = 13.35
 EFFECTIVE AREA (ACRES) = 72.86 AREA-AVERAGED Fm (INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 72.9 PEAK FLOW RATE (CFS) = 107.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.00
 FLOW VELOCITY (FEET/SEC.) = 6.10 DEPTH*VELOCITY (FT*FT/SEC.) = 4.39
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 278.3 FT WITH ELEVATION-DROP = 6.0 FT, IS 34.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20630.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20630.00 = 3753.80 FEET.
******************
 FLOW PROCESS FROM NODE 20630.00 TO NODE 20631.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2097.00 DOWNSTREAM ELEVATION(FEET) = 2088.00
 STREET LENGTH (FEET) = 362.66 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

File name: LR0206ZZ.RES

Page 26

Date: 04/21/2014

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.22 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.72HALFSTREET FLOOD WIDTH (FEET) = 28.94 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.53 PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 4.70 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 26.13 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.058 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" В 1.22 0.75 0.400 56 CONDOMINIUMS В 3.44 0.75 0.350 56 RESIDENTIAL ".4 DWELLING/ACRE" В 0.22 0.75 0.900 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 2.91 0.75 0.600 56 COMMERCIAL В 1.38 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412 SUBAREA AREA(ACRES) = 9.17 SUBAREA RUNOFF(CFS) = 14.45 EFFECTIVE AREA(ACRES) = 82.03 AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.64 TOTAL AREA (ACRES) = 82.0 PEAK FLOW RATE (CFS) = 118.49 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH (FEET) = 0.73 HALFSTREET FLOOD WIDTH (FEET) = 29.36 FLOW VELOCITY (FEET/SEC.) = 6.59 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.79 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 362.7 FT WITH ELEVATION-DROP = 9.0 FT, IS 35.8 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20631.00 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20631.00 = 4116.46 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20631.00 TO NODE 20632.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2088.00 DOWNSTREAM ELEVATION(FEET) = 2080.00 STREET LENGTH (FEET) = 271.89 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.76 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.72HALFSTREET FLOOD WIDTH (FEET) = 28.88 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.11 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 5.10 STREET FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 26.77 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.029 SUBAREA LOSS RATE DATA (AMC II): SCS SOIL AREA DEVELOPMENT TYPE/ Fρ SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" В 0.65 0.75 0.400 56 CONDOMINIUMS В 1.64 0.75 0.350 56 RESIDENTIAL B 3.35 B 1.11 "3-4 DWELLINGS/ACRE" 0.75 0.600 56 COMMERCIAL 0.75 0.100 RESIDENTIAL ".4 DWELLING/ACRE" В 0.16 0.75 0.900 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448 SUBAREA AREA(ACRES) = 6.91 SUBAREA RUNOFF (CFS) = 10.53EFFECTIVE AREA(ACRES) = 88.94 AREA-AVERAGED Fm(INCH/HR) = 0.44 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.63TOTAL AREA (ACRES) = 88.9 PEAK FLOW RATE (CFS) = 126.84 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.18 FLOW VELOCITY (FEET/SEC.) = 7.14 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.17 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20632.00 = 4388.35 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20632.00 TO NODE 20633.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION (FEET) = 2080.00 DOWNSTREAM ELEVATION (FEET) = 2074.00 STREET LENGTH (FEET) = 252.32 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86

Date: 04/21/2014 File name: LR0206ZZ.RES Page 27 Date: 04/21/2014 File name: LR0206ZZ.RES Page 28

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 146.01
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     163.51
   ***STREET FLOWING FULL***
                                                                                     ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.78
                                                                                     STREET FLOW DEPTH(FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 32.11
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 28.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.84
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.78
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.35
 STREET FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 27.39
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 0.18 Tc (MIN.) = 27.56
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.001
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.993
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                           SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                        LAND USE
                                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                                   RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                                4.07
                                                                                    "8-10 DWELLINGS/ACRE"
                                                                                                        B 0.22
                                          0.75
                                                  0.400
                                                        56
                                                                                                                            0.75
                                                                                                                                    0.400
                                                                                                                                            56
 RESIDENTIAL
                                                                                   COMMERCIAL
                                                                                                           B 0.35
                                                                                                                            0.75
                                                                                                                                    0.100
                                                                                                                                            56
 "3-4 DWELLINGS/ACRE" B
                               3.86
                                          0.75
                                                  0.600
                                                        56
                                                                                   RESIDENTIAL
 RESIDENTIAL
                                                                                    ".4 DWELLING/ACRE"
                                                                                                         B 0.11 0.75 0.900
 ".4 DWELLING/ACRE"
                       В
                                20.53
                                         0.75
                                                0.900 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 COMMERCIAL
                               1.08
                                         0.75 0.100 56
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 MOBILE HOME PARK
                       В
                                0.18
                                          0.75
                                                  0.250 56
                                                                                   SUBAREA AREA(ACRES) = 0.68
                                                                                                                  SUBAREA RUNOFF(CFS) = 1.07
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   EFFECTIVE AREA(ACRES) = 119.34 AREA-AVERAGED Fm(INCH/HR) = 0.47
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760
                                                                                   AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66
 SUBAREA AREA(ACRES) = 29.72 SUBAREA RUNOFF(CFS) = 38.33
                                                                                   TOTAL AREA(ACRES) = 119.3
                                                                                                                   PEAK FLOW RATE (CFS) = 163.22
 EFFECTIVE AREA(ACRES) = 118.66 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA(ACRES) = 118.7 PEAK FLOW RATE(CFS) = 162.97
                                                                                    5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                                   DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.27
                                                                                   FLOW VELOCITY (FEET/SEC.) = 9.77 DEPTH*VELOCITY (FT*FT/SEC.) = 6.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 33.58
                                                                                    *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 FLOW VELOCITY (FEET/SEC.) = 7.00 DEPTH*VELOCITY (FT*FT/SEC.) = 5.68
                                                                                         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                   SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
       AND L = 252.3 FT WITH ELEVATION-DROP = 6.0 FT, IS 119.7 CFS,
                                                                                   ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20633.00
                                                                                   ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20633.00 = 4640.67 FEET.
                                                                                   ASSUME FULL-FLOWING PIPELINE
                                                                                   PIPE-FLOW VELOCITY (FEET/SEC.) = 41.36
******************
                                                                                   PIPE-FLOW(CFS) = 130.04
 FLOW PROCESS FROM NODE 20633.00 TO NODE 20644.00 IS CODE = 63
                                                                                   PIPEFLOW TRAVEL TIME (MIN.) = 0.04 Tc (MIN.) = 27.43
______
                                                                                   * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.999
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    SUBAREA AREA(ACRES) = 0.68 SUBAREA RUNOFF(CFS) = 1.07
                                                                                   TOTAL AREA (ACRES) = 119.3 PEAK FLOW RATE (CFS) = 163.85
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 2074.00 DOWNSTREAM ELEVATION (FEET) = 2068.00
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET LENGTH (FEET) = 104.43 CURB HEIGHT (INCHES) = 6.0
                                                                                    5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                   STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 33.81
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     STREET FLOW DEPTH (FEET) = 0.46
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 16.48
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.97
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.72
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET.
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ******************
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
                                                                                   FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 29 Date: 04/21/2014 File name: LR0206ZZ.RES Page 30

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.43
 RAINFALL INTENSITY (INCH/HR) = 2.00
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 119.34
 TOTAL STREAM AREA(ACRES) = 119.34
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 163.85
******************
 FLOW PROCESS FROM NODE 20640.00 TO NODE 20641.00 IS CODE = 21
.......
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1072.64
 ELEVATION DATA: UPSTREAM(FEET) = 2182.00 DOWNSTREAM(FEET) = 2120.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.781
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.501
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Aр
                                                     SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 7.20
                                    0.75 0.400 56 10.78
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       B 2.52 0.61 1.000 66 20.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556
 SUBAREA RUNOFF (CFS) = 27.30
 TOTAL AREA (ACRES) = 9.72 PEAK FLOW RATE (CFS) = 27.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20641.00 TO NODE 20642.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2119.00
 STREET LENGTH (FEET) = 375.42 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     29.45
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.37
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.34
 STREET FLOW TRAVEL TIME (MIN.) = 3.11 Tc (MIN.) = 13.89
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.007
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                      Fр
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       B 1.12 0.61 1.000
                                                          66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78 0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.754
 SUBAREA AREA (ACRES) = 1.90 SUBAREA RUNOFF (CFS) = 4.31
 EFFECTIVE AREA(ACRES) = 11.62 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) = 27.30
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.64
 FLOW VELOCITY (FEET/SEC.) = 1.97 DEPTH*VELOCITY (FT*FT/SEC.) = 1.28
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20642.00 = 1448.06 FEET.
******************
 FLOW PROCESS FROM NODE 20642.00 TO NODE 20643.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2119.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
 STREET LENGTH (FEET) = 635.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  31.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
```

File name: LR0206ZZ.RES

Page 32

Date: 04/21/2014

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90

```
HALFSTREET FLOOD WIDTH (FEET) = 18.00
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.64
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.27
 STREET FLOW TRAVEL TIME (MIN.) = 2.28 Tc (MIN.) = 16.17
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.745
 SUBAREA LOSS RATE DATA (AMC II):
                                         Ар
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                            3.99
                                   0.75 0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA (ACRES) = 3.99 SUBAREA RUNOFF (CFS) = 8.78
 EFFECTIVE AREA(ACRES) = 15.61 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 15.6 PEAK FLOW RATE (CFS) =
                                                     33.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 4.73 DEPTH*VELOCITY (FT*FT/SEC.) = 2.34
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20643.00 = 2083.06 FEET.
******************
 FLOW PROCESS FROM NODE 20643.00 TO NODE 20644.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 2100.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2068.00
 FLOW LENGTH (FEET) = 663.17 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 10.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.31
 PIPE-FLOW(CFS) =
                  33.33
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 16.85
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20644.00 = 2746.23 FEET.
******************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.85
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.678
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            qΑ
                                                    SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 1.89
                                      0.75
                                             0.400 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                             0.02
                                      0.75
                                             0.600
                                                    56
 COMMERCIAL
                       В
                              0.11
                                      0.75
                                             0.100 56
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386
 SUBAREA AREA(ACRES) = 2.02 SUBAREA RUNOFF(CFS) = 4.34
 EFFECTIVE AREA(ACRES) = 17.63 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.52
 TOTAL AREA (ACRES) = 17.6 PEAK FLOW RATE (CFS) =
                                                   36.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
*******************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 16.85
 RAINFALL INTENSITY (INCH/HR) = 2.68
 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp (INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.52
 EFFECTIVE STREAM AREA(ACRES) = 17.63
 TOTAL STREAM AREA(ACRES) = 17.63
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 36.74
 ** CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae
  STREAM
                                                   HEADWATER
 NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
          163.85 27.43 1.999 0.72(0.47) 0.66 119.3 20620.00
   2
          36.74 16.85 2.678 0.70(0.36) 0.52 17.6 20640.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
         182.19 16.85 2.678 0.72(0.45) 0.63 90.9 20640.00
   2 189.82 27.43 1.999 0.72(0.46) 0.64 137.0 20620.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 189.82 Tc (MIN.) = 27.43
 EFFECTIVE AREA(ACRES) = 136.97 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.64
 TOTAL AREA(ACRES) = 137.0
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET.
******************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20645.00 IS CODE = 63
______
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2068.00 DOWNSTREAM ELEVATION(FEET) = 2059.00
 STREET LENGTH (FEET) = 221.04 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 34

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 203.03
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.80
 HALFSTREET FLOOD WIDTH (FEET) = 32.90
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.07
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.24
STREET FLOW TRAVEL TIME (MIN.) = 0.41 Tc (MIN.) = 27.83
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.982
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"8-10 DWELLINGS/ACRE" B 0.33
                                         0.75
                                                 0.400 56
           В 2.57
                                         0.75
                                                 0.100 56
COMMERCIAL
RESIDENTIAL
".4 DWELLING/ACRE" B 6.71
                                         0.75
                                                 0.900 56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 9.85 0.75 0.600 56
                      B
                               0.01 0.75 0.250 56
MOBILE HOME PARK
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 26.42
EFFECTIVE AREA(ACRES) = 156.44 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.64
TOTAL AREA (ACRES) = 156.4 PEAK FLOW RATE (CFS) = 214.07
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 33.58
FLOW VELOCITY (FEET/SEC.) = 9.20 DEPTH*VELOCITY (FT*FT/SEC.) = 7.46
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 30.0 INCH PIPE IS 23.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 46.04
PIPE-FLOW(CFS) = 189.82
PIPEFLOW TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 27.51
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.996
SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 26.67
TOTAL AREA (ACRES) = 156.4 PEAK FLOW RATE (CFS) = 216.05
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 26.24
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.20
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
           220.05 16.93 2.671 0.72(0.46) 0.63 110.4 20640.00
           216.05 27.51 1.996 0.72(0.46) 0.64 156.4 20620.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 220.05 Tc (MIN.) = 16.93
 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.72
 AREA-AVERAGED AD = 0.63 EFFECTIVE AREA (ACRES) = 110.41
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20645.00 = 4966.14 FEET.
******************
 FLOW PROCESS FROM NODE 20645.00 TO NODE 20646.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2059.00 DOWNSTREAM ELEVATION(FEET) = 2046.00
 STREET LENGTH (FEET) = 302.67 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   237.12
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.83
   HALFSTREET FLOOD WIDTH (FEET) = 34.61
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.99
 STREET FLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 17.46
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.622
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
   LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 9.08
COMMERCIAL B 5.79
                                         0.75
                                                 0.400
                                         0.75 0.100
                                                         56
 RESTDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.74
                                         0.75 0.500
       Date: 04/21/2014
                       File name: LR0206ZZ.RES
                                                       Page 36
```

```
RESIDENTIAL.
                                                                             DEPTH OF FLOW IN 48.0 INCH PIPE IS 34.4 INCHES
 ".4 DWELLING/ACRE" B 0.22 0.75 0.900 56
                                                                             PIPE-FLOW VELOCITY (FEET/SEC.) = 26.31
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.302
                                                                            PIPE-FLOW(CFS) = 253.59
 SUBAREA AREA (ACRES) = 15.83 SUBAREA RUNOFF (CFS) = 34.14
                                                                             PIPE TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 17.26
 EFFECTIVE AREA(ACRES) = 126.24 AREA-AVERAGED Fm(INCH/HR) = 0.60
                                                                             LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20647.00 = 5593.87 FEET.
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.83
                                                                           *******************
 TOTAL AREA (ACRES) = 172.3 PEAK FLOW RATE (CFS) = 229.74
                                                                             FLOW PROCESS FROM NODE 20647.00 TO NODE 20647.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            _____
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                             MAINLINE TC (MIN.) = 17.26
 DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 34.19
                                                                             * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.640
 FLOW VELOCITY (FEET/SEC.) = 9.53 DEPTH*VELOCITY (FT*FT/SEC.) = 7.85
                                                                             SUBAREA LOSS RATE DATA (AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                                                                                                 SCS
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                               LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
                                                                             MOBILE HOME PARK B
                                                                                                         20.06
                                                                                                                  0.75
                                                                                                                          0.250
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                             RESIDENTIAL
                                                                             ".4 DWELLING/ACRE" B 29.79
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                                                   0.75
                                                                                                                          0.900
                                                                                                                                  56
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" B 14.97
 ASSUME FULL-FLOWING PIPELINE
                                                                                                                   0.75
                                                                                                                          0.600
                                                                                                                                  56
 PIPE-FLOW VELOCITY(FEET/SEC.) = 41.50
                                                                             RESIDENTIAL
                                                                                                В 13.31
                                                                                                                   0.75
                                                                                                                          0.400
 PIPE-FLOW(CFS) = 203.87
                                                                             "8-10 DWELLINGS/ACRE"
                                                                                                 В 16.98
 PIPEFLOW TRAVEL TIME (MIN.) = 0.12 Tc (MIN.) = 17.05
                                                                             COMMERCIAL
                                                                                                                   0.75
                                                                                                                          0.100
                                                                                                                                  56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.659
                                                                             RESIDENTIAL
                                                                             "5-7 DWELLINGS/ACRE" B 17.61 0.75 0.500
 SUBAREA AREA(ACRES) = 15.83 SUBAREA RUNOFF(CFS) = 34.67
 TOTAL AREA (ACRES) = 172.3 PEAK FLOW RATE (CFS) = 233.96
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
                                                                             SUBAREA AREA (ACRES) = 112.72 SUBAREA RUNOFF (CFS) = 229.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             EFFECTIVE AREA(ACRES) = 238.96 AREA-AVERAGED Fm(INCH/HR) = 0.49
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.68
                                                                             TOTAL AREA (ACRES) = 285.0 PEAK FLOW RATE (CFS) = 461.49
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 30.09
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.46
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
   HALFSTREET FLOOD WIDTH (FEET) = 16.63
                                                                             5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.39
                                                                             ** PEAK FLOW RATE TABLE **
                                                                                                                     Ap Ae
                                                                              STREAM Q Tc Intensity Fp(Fm)
                                                                                                                                 HEADWATER
 ** PEAK FLOW RATE TABLE **
                                                                             NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                             1 481.12 17.26 2.640 0.73(0.40) 0.55 239.0 20640.00
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                               2 401.92 27.84 1.981 0.73(0.41) 0.57 285.0 20620.00
    1
          253.59 17.05 2.659 0.72(0.43) 0.59 126.2 20640.00
                                                                             NEW PEAK FLOW DATA ARE:
    2 240.45 27.63 1.991 0.72(0.44) 0.61 172.3 20620.00
                                                                             PEAK FLOW RATE (CFS) = 481.12 Tc (MIN.) = 17.26
                                                                             AREA-AVERAGED Fm (INCH/HR) = 0.40 AREA-AVERAGED Fp (INCH/HR) = 0.73
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 253.59 Tc (MIN.) = 17.05
                                                                             AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 238.96
 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.72
                                                                            ****************
 AREA-AVERAGED Ap = 0.59 EFFECTIVE AREA(ACRES) = 126.24
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20646.00 = 5268.81 FEET.
                                                                             FLOW PROCESS FROM NODE 20647.00 TO NODE 20648.00 IS CODE = 31
*******************
                                                                            >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20646.00 TO NODE 20647.00 IS CODE = 31
                                                                            >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
.....
                                                                           ______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 2030.00 DOWNSTREAM(FEET) = 2025.00
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
                                                                             FLOW LENGTH (FEET) = 149.90 MANNING'S N = 0.013
_____
                                                                             DEPTH OF FLOW IN 63.0 INCH PIPE IS 49.7 INCHES
 ELEVATION DATA: UPSTREAM(FEET) = 2046.00 DOWNSTREAM(FEET) = 2030.00
                                                                            PIPE-FLOW VELOCITY (FEET/SEC.) = 26.28
 FLOW LENGTH (FEET) = 325.06 MANNING'S N = 0.013
                                                                             ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 38

```
PIPE-FLOW(CFS) = 481.12
 PIPE TRAVEL TIME (MIN.) = 0.10 Tc (MIN.) = 17.35
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
*****************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 17.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.631
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.31 0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA(ACRES) = 0.31 SUBAREA RUNOFF(CFS) = 0.63
 EFFECTIVE AREA(ACRES) = 239.27 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.55
 TOTAL AREA (ACRES) = 285.3 PEAK FLOW RATE (CFS) = 481.12
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
******************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
   1
         481.12 17.35 2.631 0.73(0.40) 0.55 239.3 20640.00
    2
         401.92 27.94 1.977 0.73 (0.41) 0.57 285.3 20620.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
         250.11 20.80 2.361 0.75(0.44) 0.58 144.5 20600.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5640.07 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
         719.20 17.35 2.631 0.74(0.41) 0.56 359.8 20640.00
         705.47 20.80 2.361 0.74(0.42) 0.57 398.7 20600.00
         602.20 27.94 1.977 0.74(0.42) 0.57
    3
                                            429.8 20620.00
  TOTAL AREA (ACRES) = 429.8
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 719.20 Tc (MIN.) = 17.352
 EFFECTIVE AREA(ACRES) = 359.81 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
```

```
TOTAL AREA(ACRES) =
                   429.8
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
***********************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20655.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2025.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 623.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.64
   HALFSTREET FLOOD WIDTH (FEET) = 75.14
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.39
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.49
 STREET FLOW TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 18.98
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.494
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                                     SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В 2.58
                                              0.500
                                                      56
                                       0.75
 COMMERCIAL
                     в 3.03
                                       0.75
                                              0.100
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.11
                                       0.75
                                              0.600
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 1.00
                                       0.75
                                              0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             0.08
                                       0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.359
 SUBAREA AREA (ACRES) = 6.80 SUBAREA RUNOFF (CFS) = 13.63
 EFFECTIVE AREA(ACRES) = 366.61 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 436.6 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

Page 40

Date: 04/21/2014 File name: LR0206ZZ.RES Page 39 Date: 04/21/2014 File name: LR0206ZZ.RES

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.64 HALFSTREET FLOOD WIDTH(FEET) = 74.90
 FLOW VELOCITY (FEET/SEC.) = 6.37 DEPTH*VELOCITY (FT*FT/SEC.) = 10.43
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 29.41
 PIPE-FLOW(CFS) = 637.10
 PIPEFLOW TRAVEL TIME (MIN.) = 0.35 Tc (MIN.) = 17.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.600
 SUBAREA AREA (ACRES) = 6.80 SUBAREA RUNOFF (CFS) = 14.28
 TOTAL AREA (ACRES) = 436.6 PEAK FLOW RATE (CFS) = 721.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 84.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 32.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.10
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          721.99 17.71 2.600 0.74(0.41) 0.56 366.6 20640.00
    1
          705.47 21.15 2.337 0.74(0.42)0.56
                                                405.5 20600.00
     3
          606.90 28.25 1.964 0.74(0.42) 0.57
                                                436.6 20620.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 721.99 Tc (MIN.) = 17.71
 AREA-AVERAGED Fm(INCH/HR) = 0.41 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.56 EFFECTIVE AREA(ACRES) = 366.61
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET.
*****************
 FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.71
 RAINFALL INTENSITY (INCH/HR) = 2.60
 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.56
 EFFECTIVE STREAM AREA(ACRES) = 366.61
 TOTAL STREAM AREA (ACRES) = 436.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 721.99
```

```
FLOW PROCESS FROM NODE 20649.00 TO NODE 20650.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 545.44
 ELEVATION DATA: UPSTREAM(FEET) = 2195.00 DOWNSTREAM(FEET) = 2170.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.492
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.779
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                               Ар
                                                       SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.54 0.75 0.700
                                                       56 10.09
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61 0.75 0.600 56 9.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 SUBAREA RUNOFF(CFS) = 21.06
 TOTAL AREA (ACRES) = 7.15 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 20650.00 TO NODE 20651.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2130.00
 STREET LENGTH (FEET) = 374.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   33.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 14.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.13
 STREET FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 10.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.594
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap
                                                       SCS
```

Page 42

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

```
LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              7.90
                                        0.75
                                                0.700
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 8.79 SUBAREA RUNOFF (CFS) = 24.35
 EFFECTIVE AREA(ACRES) = 15.94 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) =
                                                        44.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.16
 FLOW VELOCITY (FEET/SEC.) = 8.10 DEPTH*VELOCITY (FT*FT/SEC.) = 3.64
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20651.00 = 920.04 FEET.
********************
 FLOW PROCESS FROM NODE 20651.00 TO NODE 20652.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2130.00 DOWNSTREAM ELEVATION(FEET) = 2080.00
 STREET LENGTH (FEET) = 427.12 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.15
 STREET FLOW TRAVEL TIME (MIN.) = 0.81 Tc (MIN.) = 11.13
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.435
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                     Fρ
                                               αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.22
                                        0.75
                                                0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В 1.35
                                        0.75
                                                0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 7.57 SUBAREA RUNOFF(CFS) = 19.93
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 23.5 PEAK FLOW RATE(CFS) =
                                                          61.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 9.12 DEPTH*VELOCITY (FT*FT/SEC.) = 4.45
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20652.00 = 1347.16 FEET.
******************
 FLOW PROCESS FROM NODE 20652.00 TO NODE 20653.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2080.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 432.48 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    67.30
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 18.62
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.50
 STREET FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 11.95
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.292
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                      в 3.90
 "2 DWELLINGS/ACRE"
                                         0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 4.35 SUBAREA RUNOFF (CFS) = 10.87
 EFFECTIVE AREA(ACRES) = 27.86 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 27.9 PEAK FLOW RATE (CFS) =
                                                           69.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
```

File name: LR0206ZZ.RES

Page 44

Date: 04/21/2014

EFFECTIVE AREA(ACRES) = 23.51 AREA-AVERAGED Fm(INCH/HR) = 0.51

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 18.87
 FLOW VELOCITY (FEET/SEC.) = 8.88 DEPTH*VELOCITY (FT*FT/SEC.) = 4.59
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20653.00 = 1779.64 FEET.
FLOW PROCESS FROM NODE 20653.00 TO NODE 20654.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
 STREET LENGTH (FEET) = 283.32 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.65
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.90
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 12.67
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.178
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                               αA
                                                     SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                              0.22
                                       0.75
                                              0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.46
                                       0.75
                                              0.600
 RESIDENTIAL
                     B 1.74 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
 SUBAREA AREA (ACRES) = 2.42 SUBAREA RUNOFF (CFS) = 5.90
 EFFECTIVE AREA(ACRES) = 30.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 30.3 PEAK FLOW RATE (CFS) = 72.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.77
 FLOW VELOCITY(FEET/SEC.) = 6.55 DEPTH*VELOCITY(FT*FT/SEC.) = 3.90
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20654.00 = 2062.96 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2030.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 164.56 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 73.31
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.37
 STREET FLOW TRAVEL TIME (MIN.) = 0.35 Tc (MIN.) = 13.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.127
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      В
                             0.41 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA (ACRES) = 0.41 SUBAREA RUNOFF (CFS) = 1.13
 EFFECTIVE AREA(ACRES) = 30.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 30.7
                                PEAK FLOW RATE (CFS) = 72.74
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.64
 FLOW VELOCITY (FEET/SEC.) = 7.86 DEPTH*VELOCITY (FT*FT/SEC.) = 4.35
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20655.00 = 2227.52 FEET.
FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.02
 RAINFALL INTENSITY (INCH/HR) = 3.13
```

Date: 04/21/2014

FLOW PROCESS FROM NODE 20654.00 TO NODE 20655.00 IS CODE = 63

Date: 04/21/2014 File name: LR0206ZZ.RES Page 45

File name: LR0206ZZ.RES Page 46

AREA-AVERAGED Fm(INCH/HR) = 0.50AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67EFFECTIVE STREAM AREA(ACRES) = 30.69 TOTAL STREAM AREA(ACRES) = 30.69 PEAK FLOW RATE (CFS) AT CONFLUENCE = 72.74 \*\* CONFLUENCE DATA \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER 721.99 17.71 2.600 0.74(0.41) 0.56 366.6 20640.00 1 1 705.47 21.15 2.337 0.74(0.42) 0.56 405.5 20600.00 1 606.90 28.25 1.964 0.74(0.42) 0.57 436.6 20620.00 72.74 13.02 3.127 0.75(0.50) 0.67 30.7 20649.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 731.39 13.02 3.127 0.74(0.42)0.57 300.2 20649.00 1 780.12 17.71 2.600 0.74(0.42) 0.57 397.3 20640.00 2 756.32 21.15 2.337 0.74(0.42) 0.57 436.2 20600.00 3 647.41 28.25 1.964 0.74(0.43) 0.58 467.3 20620.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 780.12 Tc (MIN.) = 17.71EFFECTIVE AREA(ACRES) = 397.30 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57TOTAL AREA(ACRES) = 467.3 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20655.00 TO NODE 20656.00 IS CODE = 63 \_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2014.00 STREET LENGTH (FEET) = 238.44 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 783.73

AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.15 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 13.98 STREET FLOW TRAVEL TIME (MIN.) = 0.39 Tc (MIN.) = 18.10 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.566 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" B 0.66 0.75 0.500 B 1.28 0.75 0.100 COMMERCIAL RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.16 0.75 0.600 RESIDENTIAL "2 DWELLINGS/ACRE" B 1.49 0.75 0.700 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.445 SUBAREA AREA (ACRES) = 3.59 SUBAREA RUNOFF (CFS) = 7.22 EFFECTIVE AREA(ACRES) = 400.89 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56TOTAL AREA(ACRES) = 470.8 PEAK FLOW RATE (CFS) = 780.12NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 1.37 HALFSTREET FLOOD WIDTH(FEET) = 61.71 FLOW VELOCITY (FEET/SEC.) = 10.14 DEPTH\*VELOCITY (FT\*FT/SEC.) = 13.94 \*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY(FEET/SEC.) = 45.25PIPE-FLOW(CFS) = 642.48PIPEFLOW TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 17.79 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.592 SUBAREA AREA (ACRES) = 3.59 SUBAREA RUNOFF (CFS) = 7.30 TOTAL AREA (ACRES) = 470.8 PEAK FLOW RATE (CFS) = 784.45SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50STREETFLOW HYDRAULICS BASED ON MAINLINE Tc : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 141.97 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.77HALFSTREET FLOOD WIDTH (FEET) = 31.44 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.92 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 5.32 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 736.71 13.11 3.114 0.74 ( 0.42 ) 0.57 303.8 20649.00 784.45 17.79 2.592 0.74(0.42) 0.56 400.9 20640.00

\*\*\*STREET FLOWING FULL\*\*\*

STREET FLOW DEPTH (FEET) = 1.38

HALFSTREET FLOOD WIDTH (FEET) = 61.84

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

SCS

56

56

56

```
756.32 21.24 2.331 0.74(0.42) 0.57
                                                 439.8 20600.00
                                                                                  DEPTH(FEET) = 1.43 HALFSTREET FLOOD WIDTH(FEET) = 64.34
           650.99 28.34 1.961 0.74(0.42) 0.57 470.8 20620.00
                                                                                  FLOW VELOCITY (FEET/SEC.) = 10.06 DEPTH*VELOCITY (FT*FT/SEC.) = 14.36
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 784.45 Tc (MIN.) = 17.79
                                                                                  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 AREA-AVERAGED Fm (INCH/HR) = 0.42 AREA-AVERAGED Fp (INCH/HR) = 0.74
                                                                                        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
 AREA-AVERAGED Ap = 0.56 EFFECTIVE AREA(ACRES) = 400.89
                                                                                  SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20656.00 = 6605.94 FEET.
                                                                                  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                  ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
********************
                                                                                  ASSUME FULL-FLOWING PIPELINE
 FLOW PROCESS FROM NODE 20656.00 TO NODE 20657.00 IS CODE = 63
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 45.61
______
                                                                                  PIPE-FLOW(CFS) = 726.10
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 0.15 Tc (MIN.) = 17.95
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.579
_____
                                                                                  SUBAREA AREA (ACRES) = 42.14 SUBAREA RUNOFF (CFS) = 79.31
 UPSTREAM ELEVATION(FEET) = 2014.00 DOWNSTREAM ELEVATION(FEET) = 2004.00
                                                                                  TOTAL AREA(ACRES) = 513.0 PEAK FLOW RATE(CFS) = 858.94
 STREET LENGTH (FEET) = 422.05 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.86
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 132.84
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREET FLOW DEPTH(FEET) = 0.76
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 31.01
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.65
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.06
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                                  ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 823.24
                                                                                   STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                         HEADWATER
   ***STREET FLOWING FULL***
                                                                                   NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                 (ACRES) NODE
                                                                                    1
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                            829.54 13.26 3.092 0.74(0.43) 0.58 346.0 20649.00
   STREET FLOW DEPTH (FEET) = 1.42
                                                                                            858.94 17.95 2.579 0.74(0.42) 0.57 443.0 20640.00
                                                                                            821.71 21.39 2.321 0.74(0.43) 0.58
                                                                                                                                   481.9 20600.00
   HALFSTREET FLOOD WIDTH (FEET) = 63.79
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.03
                                                                                            704.26 28.48 1.955 0.74(0.43) 0.58 513.0 20620.00
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 14.19
                                                                                  NEW PEAK FLOW DATA ARE:
 STREET FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 18.50
                                                                                  PEAK FLOW RATE (CFS) = 858.94 Tc (MIN.) = 17.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.533
                                                                                  AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 443.03
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                                 αA
                                                                                  LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20657.00 = 7027.99 FEET.
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 *****************
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                              0.99
                                         0.75
                                                 0.500
                                                       56
                                                                                  FLOW PROCESS FROM NODE 20657.00 TO NODE 20658.00 IS CODE = 63
                     В
                                2.55
                                         0.75
                                                 0.100
                                                         56
 COMMERCIAL
                       В
 RESIDENTIAL
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                       56
 "3-4 DWELLINGS/ACRE" B 3.13
                                                 0.600
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                         0.75
                                                                                 _____
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В 35.47
                                         0.75
                                                 0.700 56
                                                                                  UPSTREAM ELEVATION(FEET) = 2004.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
                                                                                  STREET LENGTH (FEET) = 653.95 CURB HEIGHT (INCHES) = 6.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.652
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AREA(ACRES) = 42.14 SUBAREA RUNOFF(CFS) = 77.57
 EFFECTIVE AREA(ACRES) = 443.03 AREA-AVERAGED Fm(INCH/HR) = 0.42
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 513.0 PEAK FLOW RATE (CFS) = 840.57
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.86
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

Date: 04/21/2014

File name: LR0206ZZ.RES

Page 49

Date: 04/21/2014

File name: LR0206ZZ.RES

Page 50

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 877.59
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.85
 HALFSTREET FLOOD WIDTH (FEET) = 85.39
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.99
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 11.06
STREET FLOW TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 19.77
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.433
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                         Fρ
                                                   Aр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B
                              1.69
                                          0.75
                                                   0.500
                                                          56
RESIDENTIAL
"2 DWELLINGS/ACRE"
                      В 14.94
                                          0.75
                                                   0.700
                                                           56
COMMERCIAL
                        В 1.47
                                          0.75
                                                   0.100
                                                          56
NATURAL FAIR COVER
"OPEN BRUSH"
                         B 1.34
                                          0.61
                                                  1.000
RESIDENTIAL
                              1.78
                                          0.75 0.600 56
"3-4 DWELLINGS/ACRE"
                     В
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.653
SUBAREA AREA(ACRES) = 21.22
                               SUBAREA RUNOFF (CFS) = 37.31
EFFECTIVE AREA(ACRES) = 464.25 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.63
TOTAL AREA (ACRES) = 534.2
                                 PEAK FLOW RATE (CFS) = 858.94
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.70
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.83 HALFSTREET FLOOD WIDTH(FEET) = 84.66
FLOW VELOCITY (FEET/SEC.) = 5.96 DEPTH*VELOCITY (FT*FT/SEC.) = 10.93
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 28.08
PIPE-FLOW(CFS) = 794.60
PIPEFLOW TRAVEL TIME (MIN.) = 0.39 Tc (MIN.) = 18.34
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.546
SUBAREA AREA (ACRES) = 21.22 SUBAREA RUNOFF (CFS) = 39.45
TOTAL AREA (ACRES) = 534.2 PEAK FLOW RATE (CFS) = 869.59
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.70
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 74.99
```

\*\*\*STREET FLOWING FULL\*\*\*

Date: 04/21/2014

STREET FLOW DEPTH(FEET) = 0.79

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

HALFSTREET FLOOD WIDTH (FEET) = 32.29 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.47 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.73\*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 861.89 13.65 3.039 0.74(0.43) 0.58 1 885.27 18.34 2.546 0.74(0.43) 0.58 464.3 20640.00 845.59 21.78 2.296 0.74(0.43) 0.58 503.1 20600.00 725.56 28.83 1.941 0.74(0.43) 0.58 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 885.27 Tc (MIN.) = 18.34 AREA-AVERAGED Fm (INCH/HR) = 0.43 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.58 EFFECTIVE AREA(ACRES) = LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 152 \_\_\_\_\_\_ >>>>STORE PEAK FLOWRATE TABLE TO A FILE< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 20658.DNA END OF STUDY SUMMARY: PEAK FLOW RATE (CFS) = 885.27 \_\_\_\_\_\_

\_\_\_\_\_\_

(ACRES) NODE

367.2 20649.00

534.2 20620.00

TOTAL AREA (ACRES) = 534.2 TC (MIN.) = 18.34 EFFECTIVE AREA(ACRES) = 464.25 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.577

\_\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

File name: LR0206ZZ.RES Page 51 Date: 04/21/2014 File name: LR0206ZZ.RES Page 52

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20764

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0207ZZ.DAT

TIME/DATE OF STUDY: 15:30 04/03/2014

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9600

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 12 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20 0 10 0	0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180
10 20.0 15.0	0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0 20.0	0.020/0.020/0.020 0.07 2.00 0.0312 0.107 0.0100
1. Relative Flow as (Maximum A 2. (Depth)*(Velo *SIZE PIPE WITH A OR EQUAL TO THE U	N-DEPTH CONSTRAINTS: N-Depth = 0.20 FEET Nllowable Street Flow Depth) - (Top-of-Curb) Ncity) Constraint = 6.0 (FT*FT/S) FLOW CAPACITY GREATER THAN NPSTREAM TRIBUTARY PIPE.* NIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
UNIT-HYDROGRAPH MO	DEL SELECTIONS/PARAMETERS:
WATERSHED LAG =	0.80 * Tc
USED "VALLEY UND	EVELOPED" S-GRAPH FOR DEVELOPMENTS OF
	LESS; AND "VALLEY DEVELOPED" S-GRAPH
FOR DEVELOPMENTS	OF 2 UNITS/ACRE AND MORE.
PRECIPITATION DA	TA ENTERED ON SUBAREA BASIS.
SIERRA MADRE DEP	TH-AREA FACTORS USED.
*ANTECEDENT MOISTUR	E CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
******	****************
FLOW PROCESS FROM	NODE 20700.00 TO NODE 20701.00 IS CODE = 21
>>>> DARTONAL MERIL	OD INITIAL SUBAREA ANALYSIS
>>USE TIME-OF-CONC	ENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
Tc = K*[(LENGTH** SUBAREA ANALYSIS U	STREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2130.00  3.00)/(ELEVATION CHANGE)]**0.20  SED MINIMUM Tc(MIN.) = 11.204  LL INTENSITY(INCH/HR) = 2.627
	S RATE DATA (AMC II):
	SCS SOIL AREA FP AP SCS TC
LAND USE	
NATURAL FAIR COVER	
"OPEN BRUSH"	B 5.30 0.61 1.000 66 19.20
RESIDENTIAL	
	E" B 4.69 0.75 0.600 56 11.20
SUBAREA AVERAGE PE	RVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
	RVIOUS AREA FRACTION, Ap = 0.812
SUBAREA RUNOFF (CFS	18.80
TOTAL AREA (ACRES)	= 9.99 PEAK FLOW RATE(CFS) = 18.80
, , ,	(1.1)
SUBAREA AREA-AVERA	GED RAINFALL DEPTH(INCH):
	1.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
J11 J.JU, JUN - U	, IIII 0.50, 5IIII 1.01, 6IIII 2.25, 21III - 5.01
	***********
	NODE 00701 00 TO NODE 00700 00 TO 0070
FLOW PROCESS FROM	NODE 20701.00 TO NODE 20702.00 IS CODE = 92
FLOW PROCESS FROM	
FLOW PROCESS FROM	
FLOW PROCESS FROM : >>>>>COMPUTE "V" G	SUTTER FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM : >>>>COMPUTE "V" G	SUTTER FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM  >>>>COMPUTE "V" G  UPSTREAM NODE ELEV.	SUTTER FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM  >>>>COMPUTE "V" G  UPSTREAM NODE ELEV. DOWNSTREAM NODE EL	GUTTER FLOW TRAVEL TIME THRU SUBAREA<>>> ZATION(FEET) = 2130.00  EVATION(FEET) = 2080.00
FLOW PROCESS FROM STREAM NODE ELEV. DOWNSTREAM NODE ELE CHANNEL LENGTH THR	CUTTER FLOW TRAVEL TIME THRU SUBAREA<
FLOW PROCESS FROM STREAM NODE ELEV. DOWNSTREAM NODE ELE CHANNEL LENGTH THR	GUTTER FLOW TRAVEL TIME THRU SUBAREA<>>> ZATION(FEET) = 2130.00  EVATION(FEET) = 2080.00
FLOW PROCESS FROM  >>>>COMPUTE "V" G  UPSTREAM NODE ELEV. DOWNSTREAM NODE EL CHANNEL LENGTH THR "V" GUTTER WIDTH (F	CUTTER FLOW TRAVEL TIME THRU SUBAREA<
PLOW PROCESS FROM  >>>>COMPUTE "V" G  UPSTREAM NODE ELEV. DOWNSTREAM NODE EL CHANNEL LENGTH THR "V" GUTTER WIDTH (F	CUTTER FLOW TRAVEL TIME THRU SUBAREA<

```
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.517
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.19
                                         0.75
                                                 0.600
                                                         56
 NATURAL FAIR COVER
                         B 2.38
 "OPEN BRUSH"
                                         0.61
                                                 1.000
                                                         66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                     в 0.08
                                       0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.10
 AVERAGE FLOW DEPTH(FEET) = 0.50 FLOOD WIDTH(FEET) = 20.70
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 12.03
 SUBAREA AREA(ACRES) = 6.65
                                SUBAREA RUNOFF(CFS) = 12.04
 EFFECTIVE AREA(ACRES) = 16.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
                                 PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 16.6
                                                           29.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.52 FLOOD WIDTH (FEET) = 23.39
 FLOW VELOCITY (FEET/SEC.) = 10.08 DEPTH*VELOCITY (FT*FT/SEC) = 5.27
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20702.00 = 1408.92 FEET.
********************
 FLOW PROCESS FROM NODE 20702.00 TO NODE 20703.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 2080.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2075.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 222.67
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH (FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.433
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.10
                                      0.75
                                                 0.600
 NATURAL FAIR COVER
                        B 3.64 0.61
 "OPEN BRUSH"
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.854
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.30
 AVERAGE FLOW DEPTH(FEET) = 0.64 FLOOD WIDTH(FEET) = 37.28
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 12.73
```

```
SUBAREA AREA(ACRES) = 5.74
                               SUBAREA RUNOFF(CFS) = 9.71
 EFFECTIVE AREA(ACRES) = 22.38 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 22.4
                               PEAK FLOW RATE(CFS) =
                                                        38.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.66 FLOOD WIDTH (FEET) = 39.07
 FLOW VELOCITY (FEET/SEC.) = 5.38 DEPTH*VELOCITY (FT*FT/SEC) = 3.53
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20703.00 = 1631.59 FEET.
******************
 FLOW PROCESS FROM NODE 20703.00 TO NODE 20704.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2075.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2070.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 175.13
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.379
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В 0.53
                                       0.61
                                              1.000
                                                      66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.24
                                       0.75
                                               0.400
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             2.09 0.75 0.600
                                                      56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.01
 AVERAGE FLOW DEPTH(FEET) = 0.65 FLOOD WIDTH(FEET) = 38.02
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 13.22
 SUBAREA AREA (ACRES) = 2.86 SUBAREA RUNOFF (CFS) = 4.92
 EFFECTIVE AREA(ACRES) = 25.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 25.2
                               PEAK FLOW RATE(CFS) =
                                                        42.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.65 FLOOD WIDTH (FEET) = 38.62
 FLOW VELOCITY (FEET/SEC.) = 6.04 DEPTH*VELOCITY (FT*FT/SEC) = 3.94
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20704.00 = 1806.72 FEET.
FLOW PROCESS FROM NODE 20704.00 TO NODE 20705.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 3 Date: 04/21/2014 File name: LR0207ZZ.RES Page 4

```
***STREET FLOWING FULL***
_____
 UPSTREAM NODE ELEVATION (FEET) = 2070.00
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 DOWNSTREAM NODE ELEVATION (FEET) = 2065.00
                                                                                   STREET FLOW DEPTH(FEET) = 0.62
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.79
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 24.18
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.66
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.90
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 15.04
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.202
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.305
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fр
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                 Ap SCS
                                                                                     LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 NATURAL FAIR COVER
     LAND USE
 RESIDENTIAL
                                                                                 "OPEN BRUSH"
                                                                                                      B 3.14
                                                                                                                        0.61
                                                                                                                               1.000
 "8-10 DWELLINGS/ACRE" B 4.91
                                        0.75
                                                0.400
                                                      56
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.43
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                                                        56
 "3-4 DWELLINGS/ACRE"
                    B 2.39
                                        0.75
                                                0.600
                                                       56
                                                                                 RESIDENTIAL
 NATURAL FAIR COVER
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                     В
                                                                                                             0.92
                                                                                                                        0.75 0.400
                                                                                                                                        56
 "OPEN BRUSH"
                        В
                           0.79 0.61 1.000
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.839
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518
                                                                                 SUBAREA AREA(ACRES) = 4.49
                                                                                                              SUBAREA RUNOFF (CFS) = 6.74
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.16
                                                                                 EFFECTIVE AREA (ACRES) = 37.82 AREA-AVERAGED Fm (INCH/HR) = 0.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.48
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
 AVERAGE FLOW DEPTH(FEET) = 0.70 FLOOD WIDTH(FEET) = 44.30
                                                                                 TOTAL AREA(ACRES) = 37.8
                                                                                                               PEAK FLOW RATE(CFS) =
                                                                                                                                         58.14
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 13.94
 SUBAREA AREA(ACRES) = 8.09 SUBAREA RUNOFF(CFS) = 14.06
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 33.33 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) =
                                                          54.49
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.24
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.66 DEPTH*VELOCITY (FT*FT/SEC.) = 2.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20706.00 = 2351.93 FEET.
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                               ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.72 FLOOD WIDTH (FEET) = 46.39
                                                                                 FLOW PROCESS FROM NODE 20706.00 TO NODE 20707.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 5.57 DEPTH*VELOCITY (FT*FT/SEC) = 4.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20705.00 = 2043.51 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 FLOW PROCESS FROM NODE 20705.00 TO NODE 20706.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2055.00
______
                                                                                 STREET LENGTH (FEET) = 216.66 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 308.42 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   58.79
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   STREET FLOW DEPTH(FEET) = 0.60
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.86
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.29
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 5 Date: 04/21/2014 File name: LR0207ZZ.RES Page 6

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
                                                                                  RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 15.73
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                         в 1.39
                                                                                                                         0.75
                                                                                                                                 0.700
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.144
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "8-10 DWELLINGS/ACRE"
                                                                                                        B 1.58 0.75 0.400
                                                                                                                                         56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                        Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
                                                                                  SUBAREA AREA (ACRES) = 7.33 SUBAREA RUNOFF (CFS) = 10.22
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78
                                         0.75 0.400 56
                                                                                  EFFECTIVE AREA(ACRES) = 45.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
                                                                                  TOTAL AREA (ACRES) = 45.9 PEAK FLOW RATE (CFS) =
                                                                                                                                          65.42
 SUBAREA AREA(ACRES) = 0.78 SUBAREA RUNOFF(CFS) = 1.29
 EFFECTIVE AREA(ACRES) = 38.60 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 38.6
                                                         58.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH (FEET) = 0.56 HALFSTREET FLOOD WIDTH (FEET) = 21.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.85 DEPTH*VELOCITY (FT*FT/SEC.) = 3.83
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                  LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20708.00 = 2906.50 FEET.
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.65
                                                                                  FLOW PROCESS FROM NODE 20708.00 TO NODE 20709.00 IS CODE = 63
                                                                                ______
 FLOW VELOCITY (FEET/SEC.) = 5.29 DEPTH*VELOCITY (FT*FT/SEC.) = 3.14
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20707.00 = 2568.59 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  >>>> (STREET TABLE SECTION # 14 USED) <<<<
******************
                                                                                _____
 FLOW PROCESS FROM NODE 20707.00 TO NODE 20708.00 IS CODE = 63
                                                                                  UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2035.00
-----
                                                                                  STREET LENGTH (FEET) = 377.00 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET HALFWIDTH (FEET) = 39.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 UPSTREAM ELEVATION(FEET) = 2055.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 337.91 CURB HEIGHT (INCHES) = 6.0
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    68.63
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH(FEET) = 0.89
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.72
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 47.97
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.60
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.10
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   63.26
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 17.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.982
   STREET FLOW DEPTH (FEET) = 0.56
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 20.76
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                  αA
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.76
                                                                                     LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
                                                                                  RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 16.56
                                                                                                        B 0.45
                                                                                                                         0.75
                                                                                                                                 0.700
                                                                                                                                         56
                                                                                  "2 DWELLINGS/ACRE"
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.078
                                                                                  NATURAL FAIR COVER
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "OPEN BRUSH"
                                                                                                         B 1.33
                                                                                                                         0.61
                                                                                                                                 1.000
                                                                                                                                         66
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                        SCS
                                                                                  RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                                1.75
                                                                                                                         0.75
                                                                                                                                 0.400
                                                                                                                                         56
     LAND USE
 NATURAL FAIR COVER
                                                                                  RESIDENTIAL.
 "OPEN BRUSH"
                                4.36
                                         0.61
                                               1.000 66
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                                1.06
                                                                                                                         0.75
                                                                                                                                 0.500
```

Date: 04/21/2014

File name: LR0207ZZ.RES

Page 7

Date: 04/21/2014 File name: LR0207ZZ.RES

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
                                                                                   TOTAL AREA (ACRES) =
                                                                                                     54.5 PEAK FLOW RATE(CFS) =
                                                                                                                                           69.91
 SUBAREA AREA(ACRES) = 4.59 SUBAREA RUNOFF(CFS) = 6.41
 EFFECTIVE AREA(ACRES) = 50.52 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 TOTAL AREA (ACRES) = 50.5 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.56
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.90 DEPTH*VELOCITY (FT*FT/SEC.) = 4.30
                                                                                  LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20710.00 = 3610.46 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 ******************
 DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 47.66
 FLOW VELOCITY (FEET/SEC.) = 4.59 DEPTH*VELOCITY (FT*FT/SEC.) = 4.08
                                                                                   FLOW PROCESS FROM NODE 20710.00 TO NODE 20711.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20709.00 = 3283.50 FEET.
                                                                                 ______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
*****************
                                                                                  >>>> (STREET TABLE SECTION # 14 USED) <<<<
 FLOW PROCESS FROM NODE 20709.00 TO NODE 20710.00 IS CODE = 63
                                                                                 _____
                                                                                  UPSTREAM ELEVATION(FEET) = 2030.00 DOWNSTREAM ELEVATION(FEET) = 2025.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 298.59 CURB HEIGHT (INCHES) = 8.0
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 39.00
_____
 UPSTREAM ELEVATION(FEET) = 2035.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 STREET LENGTH (FEET) = 326.96 CURB HEIGHT (INCHES) = 8.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 39.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     73.36
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06
                                                                                    STREET FLOW DEPTH (FEET) = 0.88
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 46.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.14
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.52
   STREET FLOW DEPTH(FEET) = 0.88
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 20.00
   HALFSTREET FLOOD WIDTH (FEET) = 46.72
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.856
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.32
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fр
                                                                                                                                   Αp
 STREET FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 19.03
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.912
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                                  4.34
                                                                                                                           0.75
                                                                                                                                  0.700
                                                                                                                                           56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                 Aр
                                                        SCS
                                                                                  NATURAL FAIR COVER
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   "OPEN BRUSH"
                                                                                                         в 0.10
                                                                                                                           0.61
                                                                                                                                  1.000
                                                                                                                                           66
 RESIDENTIAL
                                                                                  RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 0.82
                                         0.75
                                                 0.700
                                                       56
                                                                                  "8-10 DWELLINGS/ACRE"
                                                                                                                 0.27
                                                                                                                          0.75
                                                                                                                                  0.400
                                                                                                                                           56
 NATURAL FAIR COVER
                                                                                  RESIDENTIAL
 "OPEN BRUSH"
                                0.94
                                         0.61
                                                 1.000
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                          B
                                                                                                                0.92
                                                                                                                          0.75 0.500
                                                         66
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 "8-10 DWELLINGS/ACRE" B
                                1.18
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
                                         0.75
                                                 0.400
 RESIDENTIAL
                                                                                  SUBAREA AREA (ACRES) = 5.63 SUBAREA RUNOFF (CFS) = 6.92
                                               0.500 56
 "5-7 DWELLINGS/ACRE"
                       В
                               1.02
                                         0.75
                                                                                  EFFECTIVE AREA(ACRES) = 60.11 AREA-AVERAGED Fm(INCH/HR) = 0.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.630
                                                                                  TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA (ACRES) = 3.96 SUBAREA RUNOFF (CFS) = 5.25
 EFFECTIVE AREA(ACRES) = 54.48 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 9

Date: 04/21/2014

File name: LR0207ZZ.RES

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                         TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 21.52
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20713.00 = 4560.55 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                        DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.87
 FLOW VELOCITY (FEET/SEC.) = 5.14 DEPTH*VELOCITY (FT*FT/SEC.) = 4.53
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20713.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20711.00 = 3909.05 FEET.
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
*******************
                                                                        ______
 FLOW PROCESS FROM NODE 20711.00 TO NODE 20712.00 IS CODE = 54
                                                                         MAINLINE Tc (MIN.) = 21.52
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
______
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2025.00 DOWNSTREAM(FEET) = 2020.00
                                                                         RESIDENTIAL
                                                                                            В
 CHANNEL LENGTH THRU SUBAREA (FEET) = 279.66 CHANNEL SLOPE = 0.0179
                                                                         "2 DWELLINGS/ACRE"
                                                                                                     2.10
                                                                                                             0.75
                                                                                                                    0.700
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         NATURAL FAIR COVER
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "OPEN BRUSH"
                                                                                                     3.26
                                                                                                             0.61
                                                                                                                   1.000
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             74.08
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.88 FLOW DEPTH (FEET) = 1.55
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                            В 1.09
                                                                                                             0.75 0.500
 TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 20.79
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20712.00 = 4188.71 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818
                                                                         SUBAREA AREA (ACRES) = 6.45 SUBAREA RUNOFF (CFS) = 7.15
********************
                                                                         EFFECTIVE AREA(ACRES) = 69.90 AREA-AVERAGED Fm(INCH/HR) = 0.49
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20712.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
                                                                         TOTAL AREA(ACRES) = 69.9
                                                                                                      PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 20.79
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.813
                                                                        SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20714.00 IS CODE = 54
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "2 DWELLINGS/ACRE"
                   В
                            2.62
                                    0.75
                                            0.700
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                        ______
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 0.72 0.75
                                            0.500
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1960.00
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 732.38 CHANNEL SLOPE = 0.0546
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
                                                                         CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 SUBAREA AREA(ACRES) = 3.34
                            SUBAREA RUNOFF (CFS) = 3.97
                                                                         MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
 EFFECTIVE AREA(ACRES) = 63.45 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                     80.78
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.71
                                                                         FLOW VELOCITY (FEET/SEC.) = 8.99 FLOW DEPTH (FEET) = 1.21
                                                                         TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 22.88
 TOTAL AREA (ACRES) = 63.5
                            PEAK FLOW RATE(CFS) =
                                                   75.74
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20714.00 = 5292.93 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        ******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                         FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 81
*****************
                                                                        ______
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20713.00 IS CODE = 54
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        _____
                                                                         MAINLINE Tc(MIN.) = 22.88
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.712
_____
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 2000.00
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                    Αp
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.84 CHANNEL SLOPE = 0.0538
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             LAND USE
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.500
                                                                         NATURAL FAIR COVER
                                                                                                   2.63
                                                                                                             0.61
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
                                                                         "OPEN BRUSH"
                                                                                              В
                                                                                                                   1.000
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            75.74
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 8.53 FLOW DEPTH (FEET) = 1.13
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                                     1.94
                                                                                                             0.75
                                                                                                                    0.500
```

Page 11

Date: 04/21/2014 File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR0207ZZ.RES Page 12

SCS

56

66

66

56

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.788
 SUBAREA AREA(ACRES) = 4.57
                             SUBAREA RUNOFF(CFS) = 4.94
 EFFECTIVE AREA(ACRES) = 74.47 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 74.5 PEAK FLOW RATE(CFS) =
                                                     81.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
 FLOW PROCESS FROM NODE 20718.00 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.44
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.738
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.050
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Αр
                                                    SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.21
                                      0.75
                                              0.600
                                                    56 8.74
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             1.38
                                      0.61
                                             1.000
                                                    66 14.97
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            5.85
                                      0.75
                                             0.700
                                                    56 9.29
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.753
 SUBAREA RUNOFF (CFS) = 16.82
 TOTAL AREA (ACRES) = 7.44 PEAK FLOW RATE (CFS) = 16.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
********************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.74
 RAINFALL INTENSITY (INCH/HR) = 3.05
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 7.44
```

```
TOTAL STREAM AREA(ACRES) = 7.44
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  16.82
FLOW PROCESS FROM NODE 20718.50 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 522.86
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.768
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.273
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Αp
                                                    SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.21
                                      0.75
                                             0.600
                                                    56
                                                       7.77
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             2.34
                                      0.61
                                            1.000
                                                    66 13.31
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                           4.69
                                      0.75 0.700
                                                        8.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.794
 SUBAREA RUNOFF(CFS) = 17.74
 TOTAL AREA (ACRES) = 7.24 PEAK FLOW RATE (CFS) = 17.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 7.77
 RAINFALL INTENSITY (INCH/HR) = 3.27
 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.79
 EFFECTIVE STREAM AREA(ACRES) = 7.24
 TOTAL STREAM AREA(ACRES) = 7.24
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               17.74
 ** CONFLUENCE DATA **
  STREAM
                 Tc Intensity Fp(Fm)
                                        Ар Ае
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
  1
           16.82 8.74 3.050 0.71(0.54)0.75 7.4 20718.00
          17.74 7.77 3.273 0.69(0.55) 0.79
                                                7.2 20718.50
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 13

Date: 04/21/2014 File name: LR0207ZZ.RES

```
** PEAK FLOW RATE TABLE **
  STREAM
                 Tc Intensity Fp(Fm)
                                       Ap Ae
           0
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          34.02 7.77 3.273 0.70(0.54)0.77 13.9 20718.50
           33.11 8.74 3.050 0.70(0.54) 0.77 14.7 20718.00
    2
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 34.02 Tc (MIN.) =
 EFFECTIVE AREA(ACRES) =
                     13.85 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 14.7
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20719.00 = 714.44 FEET.
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20722.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2040.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 351.50
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.117
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 5.48 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.85
 AVERAGE FLOW DEPTH(FEET) = 0.58 FLOOD WIDTH(FEET) = 30.41
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 8.43
 SUBAREA AREA(ACRES) = 5.48 SUBAREA RUNOFF(CFS) = 12.79
 EFFECTIVE AREA(ACRES) = 19.33 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.60 FLOOD WIDTH(FEET) = 32.05
 FLOW VELOCITY (FEET/SEC.) = 8.97 DEPTH*VELOCITY (FT*FT/SEC) = 5.35
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20722.00 = 1065.94 FEET.
******************
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.43
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 19.33
 TOTAL STREAM AREA(ACRES) = 20.16
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 44.86
******************
 FLOW PROCESS FROM NODE 20720.00 TO NODE 20721.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1046.89
 ELEVATION DATA: UPSTREAM(FEET) = 2105.00 DOWNSTREAM(FEET) = 2020.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.682
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.562
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Aр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 5.65 0.75 0.700
                                                      56 11.68
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 10.37
 TOTAL AREA (ACRES) = 5.65 PEAK FLOW RATE (CFS) = 10.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*******************
 FLOW PROCESS FROM NODE 20721.00 TO NODE 20722.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 2020.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 115.32
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.525
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Αр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.32
                                       0.75
                                              0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                             4.12
                                       0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.70
 AVERAGE FLOW DEPTH(FEET) = 0.49 FLOOD WIDTH(FEET) = 19.50
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 16

RAINFALL INTENSITY (INCH/HR) = 3.12

```
"V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 11.97
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 SUBAREA AREA(ACRES) = 5.44
                              SUBAREA RUNOFF(CFS) = 9.47
                                                                           ______
 EFFECTIVE AREA(ACRES) = 11.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2015.00
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.81
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 2000.00
 TOTAL AREA (ACRES) = 11.1 PEAK FLOW RATE (CFS) =
                                                      19.64
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 664.99
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH(FEET) = 1.00
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.772
 DEPTH(FEET) = 0.52 FLOOD WIDTH(FEET) = 23.24
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 6.70 DEPTH*VELOCITY (FT*FT/SEC) = 3.50
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                               SCS
                                                                                LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            RESIDENTIAL
*******************
                                                                            "2 DWELLINGS/ACRE" B 5.92
                                                                                                                 0.75 0.700
                                                                                                                                56
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
                                                                            NATURAL FAIR COVER
______
                                                                            "OPEN BRUSH"
                                                                                                В
                                                                                                      5.87 0.61 1.000
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.849
_____
                                                                            TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.51
 TOTAL NUMBER OF STREAMS = 2
                                                                            TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.10
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                            AVERAGE FLOW DEPTH(FEET) = 0.77 FLOOD WIDTH(FEET) = 52.21
                                                                            "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 10.25
 TIME OF CONCENTRATION (MIN.) = 11.97
 RAINFALL INTENSITY (INCH/HR) = 2.53
                                                                            SUBAREA AREA(ACRES) = 11.79 SUBAREA RUNOFF(CFS) = 23.38
 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            EFFECTIVE AREA(ACRES) = 38.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.79
 AREA-AVERAGED Fp(INCH/HR) = 0.69
                                                                            TOTAL AREA (ACRES) = 43.0 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Ap = 0.81
                                                                                                                                 77.81
 EFFECTIVE STREAM AREA(ACRES) = 11.09
 TOTAL STREAM AREA(ACRES) = 11.09
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 19.64
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 ** CONFLUENCE DATA **
                                                                            END OF SUBAREA "V" GUTTER HYDRAULICS:
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                            DEPTH(FEET) = 0.78 FLOOD WIDTH(FEET) = 53.26
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            FLOW VELOCITY (FEET/SEC.) = 6.13 DEPTH*VELOCITY (FT*FT/SEC) = 4.76
    1
         44.86 8.43 3.117 0.72 (0.54) 0.75 19.3 20718.50
                                                                            LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20723.00 = 1827.20 FEET.
          43.19 9.40 2.919 0.72(0.54)0.75 20.2 20718.00
    1
                                                                           ******************
    2
          19.64 11.97 2.525 0.69(0.56) 0.81 11.1 20720.00
                                                                            FLOW PROCESS FROM NODE 20723.00 TO NODE 20724.00 IS CODE = 92
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                           ______
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                           _____
 ** PEAK FLOW RATE TABLE **
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2000.00
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 1960.00
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 2.00
          62.85 8.43 3.117 0.71 (0.54) 0.77 27.1 20718.50
   1
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
          61.71 9.40 2.919 0.71(0.54)0.77 28.9 20718.00
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
          55.69 11.97 2.525 0.70(0.55)0.77 31.2 20720.00
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH(FEET) = 1.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.772
 PEAK FLOW RATE (CFS) = 62.85 Tc (MIN.) = 8.43
                                                                            SUBAREA LOSS RATE DATA(AMC II):
 EFFECTIVE AREA(ACRES) = 27.14 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fр
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 TOTAL AREA (ACRES) = 31.2
                                                                            NATURAL FAIR COVER
                                                                                               B 9.77 0.61 1.000
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            "OPEN BRUSH"
                                                                                                                               66
                                                                            RESIDENTIAL
*****************
                                                                            "5-7 DWELLINGS/ACRE" B 0.38 0.75 0.500
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20723.00 IS CODE = 92
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.981
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 17

Date: 04/21/2014 File name: LR0207ZZ.RES

```
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 155.65
 AVERAGE FLOW DEPTH(FEET) = 0.35 FLOOD WIDTH(FEET) = 3.00
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.00 Tc (MIN.) = 10.25
 SUBAREA AREA(ACRES) = 10.15
                              SUBAREA RUNOFF (CFS) = 19.79
 EFFECTIVE AREA(ACRES) = 49.08 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.83
 TOTAL AREA (ACRES) =
                   53.2
                              PEAK FLOW RATE(CFS) =
                                                       97.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
       NOTE: TRAVEL TIME ESTIMATES BASED ON NORMAL
       DEPTH EQUAL TO [GUTTER-HIKE + PAVEMENT LIP]
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.35 FLOOD WIDTH(FEET) = 3.00
 FLOW VELOCITY(FEET/SEC.) = 155.65 DEPTH*VELOCITY(FT*FT/SEC) = 54.48
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 1829.20 FEET.
FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
           97.60 10.25 2.772 0.68 (0.56) 0.83 49.1 20718.50
    1
    2
           94.24 11.24 2.623 0.68(0.56)0.83 50.8 20718.00
           83.88 13.85 2.314 0.68 ( 0.56) 0.83
    3
                                             53.2 20720.00
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 1829.20 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
           81.69 22.88 1.712 0.68(0.49)0.73 74.5 20700.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
    1
          166.01 10.25 2.772 0.68 (0.53) 0.79 82.4 20718.50
          164.35 11.24 2.623 0.68(0.53)0.79
                                             87.4 20718.00
                                              98.3 20720.00
          157.74 13.85 2.314 0.68 (0.53) 0.78
    3
         136.75 22.88
                       1.712 0.68(0.52)0.77
                                             127.7 20700.00
  TOTAL AREA (ACRES) =
                       127.7
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 166.01 Tc (MIN.) = 10.248
 EFFECTIVE AREA(ACRES) = 82.44 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 127.7
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 12
```

```
>>>>CLEAR MEMORY BANK # 1 <<<<
_____
******************
FLOW PROCESS FROM NODE 20724.00 TO NODE 20725.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1958.00
 FLOW LENGTH (FEET) = 81.40 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.01
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 166.01
 PIPE TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 10.32
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20725.00 = 5374.33 FEET.
******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
***********************
 FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 15.1
______
>>>>DEFINE MEMORY BANK # 2 <<<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20658.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
       Q Tc Fp(Fm) Ap Ae HEADWATER
 NUMBER
         (CFS) (MIN.) (INCH/HR) (ACRES) NODE
  1
        861.89 13.65 0.74(0.43) 0.58 367.2 20649.00
        885.27 18.34 0.74(0.43) 0.58
                                464.3 20640.00
        845.59 21.78 0.74(0.43) 0.58
                                503.1 20600.00
        725.56 28.83 0.74(0.43) 0.58
                               534.2 20620.00
  TOTAL AREA(ACRES) =
                   534.2
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
******************
 FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 STREAM
          0
             Tc
                   Fp(Fm) Ap Ae HEADWATER
 NUMBER
         (CFS) (MIN.) (INCH/HR) (ACRES) NODE
  1
        861.89 13.65 0.74(0.43) 0.58
                               367.2 20649.00
                                464.3 20640.00
        885.27 18.34 0.74(0.43) 0.58
        845.59 21.78 0.74(0.43)0.58
                                503.1 20600.00
        725.56 28.83 0.74(0.43) 0.58
                                534.2 20620.00
  TOTAL AREA(ACRES) =
                   534.2
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 20

```
FLOW VELOCITY (FEET/SEC.) = 13.05 DEPTH*VELOCITY (FT*FT/SEC.) = 16.94
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 29.14
 PIPE-FLOW(CFS) =
                   824.67
 PIPEFLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 18.87
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.921
 SUBAREA AREA (ACRES) = 20.46 SUBAREA RUNOFF (CFS) = 25.10
 TOTAL AREA(ACRES) = 554.7
                             PEAK FLOW RATE(CFS) = 885.27
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 60.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.39
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.70
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.67
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
*******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm)
                                        Ap Ae
                                                       HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
    1
           861.89 14.19 2.280 0.73(0.44) 0.60 387.6 20649.00
                                                 484.7 20640.00
           885.27 18.87 1.921 0.74(0.43) 0.59
          845.59 22.32
                        1.738 0.74(0.43) 0.59 523.6 20600.00
          725.56 29.31
                         1.476 0.73(0.44)0.59
                                               554.7 20620.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           0
                 Tc Intensity Fp(Fm)
                                              Аe
                                                       HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
  1
          166.01 10.32 2.760 0.68(0.53) 0.79 82.4 20718.50
    2
          164.35 11.31 2.612 0.68(0.53) 0.79 87.4 20718.00
          157.74 13.92
                        2.306 0.68(0.53)0.78
                                                 98.3 20720.00
                        1.709 0.68(0.52)0.77 127.7 20700.00
          136.75 22.96
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20725.00 = 5374.33 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM
            0
                Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
    1
           956.30 10.32 2.760 0.72(0.46) 0.64 364.5 20718.50
          975.35 11.31 2.612 0.72 ( 0.46) 0.64 396.5 20718.00
         1015.44 13.92 2.306 0.72(0.46) 0.63 478.7 20720.00
       Date: 04/21/2014
```

Date: 04/21/2014

```
1019.01 14.19 2.280 0.72(0.46) 0.63
                                             486.8 20649.00
         1031.50 18.87
                      1.921 0.72(0.45) 0.62
                                             599.1 20640.00
         983.82 22.32
                      1.738 0.72(0.45)0.62
                                             649.2 20600.00
         971.39 22.96 1.709 0.72(0.45) 0.63
                                             654.1 20700.00
         835.46 29.31
                      1.476 0.72(0.45)0.63
                                            682.3 20620.00
                       682.3
  TOTAL AREA (ACRES) =
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1031.50 Tc (MIN.) = 18.875
 EFFECTIVE AREA(ACRES) = 599.09 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) =
                  682.3
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 71
______
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD <<<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
_____
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.83;1H= 1.10;3H= 1.88;6H= 2.63;24H= 6.05
 S-GRAPH: VALLEY(DEV.) = 77.8%; VALLEY(UNDEV.)/DESERT= 22.2%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.49; LAG(HR) = 0.39; Fm(INCH/HR) = 0.45; Ybar = 0.46
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 682.3
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0454; Lca/L=0.4,n=.0407; Lca/L=0.5,n=.0374; Lca/L=0.6,n=.0349
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 208.34
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 821.75
 TOTAL PEAK FLOW RATE (CFS) = 821.75 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 1031.50
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 1031.50)
 PEAK FLOW RATE (CFS) USED = 1031.50
********************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
_____
FLOW PROCESS FROM NODE 20725.00 TO NODE 20726.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1958.00 DOWNSTREAM(FEET) = 1872.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1421.01 CHANNEL SLOPE = 0.0605
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50
 FLOW VELOCITY (FEET/SEC.) = 34.41 FLOW DEPTH (FEET) = 2.65
 TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 30.00
```

```
*******************
 FLOW PROCESS FROM NODE 20726.00 TO NODE 20726.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 30.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.455
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               Aр
                                                      SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       В
                               3.96
                                       0.75
                                               0.500
                                                      56
 RESIDENTIAL
                     B 4.31
                                       0.75
                                               0.700
                                                      56
 "2 DWELLINGS/ACRE"
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       B 14.46
                                       0.61
                                              1.000
                                                      66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                             0.98
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845
 SUBAREA AREA (ACRES) = 23.71
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.83;1H= 1.10;3H= 1.87;6H= 2.62;24H= 6.02
 S-GRAPH: VALLEY(DEV.) = 76.5%; VALLEY(UNDEV.)/DESERT= 23.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.50; LAG(HR) = 0.40; Fm(INCH/HR) = 0.46; Ybar = 0.46
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0427; Lca/L=0.4,n=.0383; Lca/L=0.5,n=.0352; Lca/L=0.6,n=.0328
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 216.71
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 828.54
 TOTAL AREA (ACRES) = 706.0 PEAK FLOW RATE (CFS) = 1031.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20726.00 TO NODE 20727.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1872.00 DOWNSTREAM(FEET) = 1835.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 760.88 CHANNEL SLOPE = 0.0486
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50
 FLOW VELOCITY (FEET/SEC.) = 31.81 FLOW DEPTH (FEET) = 2.80
 TRAVEL TIME (MIN.) = 0.40 Tc (MIN.) = 30.40
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET.
```

File name: LR020777.RFS

Page 24

Date: 04/21/2014

LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20727.00 TO NODE 20727.00 IS CODE = 81 \_\_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc (MIN.) = 30.40\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.444 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" В 1.92 0.500 0.75 56 RESIDENTIAL "2 DWELLINGS/ACRE" B 6.30 0.700 0.75 56 NATURAL FAIR COVER 12.35 1.000 "OPEN BRUSH" 0.61 66 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.34 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857 SUBAREA AREA (ACRES) = 20.91UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.41;30M= 0.83;1H= 1.09;3H= 1.86;6H= 2.61;24H= 5.99 S-GRAPH: VALLEY(DEV.) = 75.4%; VALLEY(UNDEV.) / DESERT = 24.6% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.51; LAG(HR) = 0.41; Fm(INCH/HR) = 0.46; Ybar = 0.46 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; 3HR = 1.00; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 726.9 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0412; Lca/L=0.4,n=.0370; Lca/L=0.5,n=.0340; Lca/L=0.6,n=.0317 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 204.35 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 814.87 TOTAL AREA (ACRES) = 726.9 PEAK FLOW RATE (CFS) = 1031.50NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20727.00 TO NODE 20728.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1835.00 DOWNSTREAM(FEET) = 1820.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 832.56 CHANNEL SLOPE = 0.0180 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50 FLOW VELOCITY (FEET/SEC.) = 21.79 FLOW DEPTH (FEET) = 3.26 TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 31.03LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc(MIN.) = 31.03\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.426 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αp SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL 3.88 0.75 0.500 "5-7 DWELLINGS/ACRE" В 56 RESIDENTIAL B 12.91 "2 DWELLINGS/ACRE" 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 6.79 0.75 0.600 56 NATURAL FAIR COVER 2.42 "OPEN BRUSH" В 0.61 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672 SUBAREA AREA(ACRES) = 26.00 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.41;30M= 0.82;1H= 1.09;3H= 1.85;6H= 2.60;24H= 5.95 S-GRAPH: VALLEY (DEV.) = 76.0%; VALLEY (UNDEV.) / DESERT = 24.0% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.52; LAG(HR) = 0.41; Fm(INCH/HR) = 0.46; Ybar = 0.47 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 752.9 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0395; Lca/L=0.4, n=.0355; Lca/L=0.5, n=.0326; Lca/L=0.6, n=.0304 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 209.62 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 821.15 TOTAL AREA (ACRES) = 752.9 PEAK FLOW RATE (CFS) = 1031.50NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01\* FLOW PROCESS FROM NODE 20728.00 TO NODE 20748.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1820.00 DOWNSTREAM(FEET) = 1815.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 259.80 CHANNEL SLOPE = 0.0192 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50 FLOW VELOCITY (FEET/SEC.) = 22.31 FLOW DEPTH (FEET) = 3.21 TRAVEL TIME (MIN.) = 0.19 Tc (MIN.) = 31.23LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET. FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

Date: 04/21/2014 File name: LR0207ZZ.RES Page 25

FLOW PROCESS FROM NODE 20728.00 TO NODE 20728.00 IS CODE = 81

```
_____
 MAINLINE Tc (MIN.) = 31.23
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.420
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            Αp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                           0.70
                                     0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA (ACRES) = 0.70
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.82;1H= 1.09;3H= 1.85;6H= 2.60;24H= 5.95
 S-GRAPH: VALLEY (DEV.) = 76.0%; VALLEY (UNDEV.) / DESERT= 24.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.46; Ybar = 0.47
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 753.6
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0391; Lca/L=0.4,n=.0350; Lca/L=0.5,n=.0322; Lca/L=0.6,n=.0300
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 209.80
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 821.75
 TOTAL AREA(ACRES) = 753.6
                            PEAK FLOW RATE (CFS) = 1031.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1031.50 Tc (MIN.) = 31.23
 AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.47
 TOTAL AREA (ACRES) = 753.6
***********************
 FLOW PROCESS FROM NODE 20730.00 TO NODE 20731.00 IS CODE = 21
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 428.13
 ELEVATION DATA: UPSTREAM(FEET) = 1955.00 DOWNSTREAM(FEET) = 1935.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.104
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.191
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Дp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
```

```
"OPEN BRUSH"
                     B 1.49 0.61 1.000 66 14.71
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     B 2.96 0.75 0.500 56 8.10
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.667
 SUBAREA RUNOFF(CFS) = 10.96
 TOTAL AREA (ACRES) = 4.45 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20731.00 TO NODE 20732.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 975.64 CHANNEL SLOPE = 0.0461
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 10.96
 FLOW VELOCITY (FEET/SEC.) = 8.98 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 9.91
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20732.00 = 1403.77 FEET.
******************
 FLOW PROCESS FROM NODE 20732.00 TO NODE 20732.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 9.91
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.828
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Aр
                                                SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   В 5.96
                                   0.61
                                         1.000
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.56
                                   0.75 0.500
                                                 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.759
 SUBAREA AREA(ACRES) = 11.52 SUBAREA RUNOFF(CFS) = 24.15
 EFFECTIVE AREA(ACRES) = 15.97 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 16.0 PEAK FLOW RATE (CFS) =
                                                 33.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20732.00 TO NODE 20733.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1845.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 862.28 CHANNEL SLOPE = 0.0522
```

File name: LR020777.RFS

Page 28

Date: 04/21/2014

```
CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
                                                                           RESIDENTIAL
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.00
                                                                           "2 DWELLINGS/ACRE"
                                                                                                   41.76
                                                                                                               0.75
                                                                                                                      0.700
                                                                                                                              56
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                           RESIDENTIAL
                             33.66
 FLOW VELOCITY (FEET/SEC.) = 13.20 FLOW DEPTH (FEET) = 0.61
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                     0.84
                                                                                                               0.75
                                                                                                                      0.600
                                                                                                                             56
 TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 11.00
                                                                           RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20733.00 = 2266.05 FEET.
                                                                                                B 4.95
                                                                           "5-7 DWELLINGS/ACRE"
                                                                                                               0.75 0.500
                                                                                                                             56
                                                                           NATURAL FAIR COVER
******************
                                                                                                В 17.32
                                                                           "OPEN BRUSH"
                                                                                                               0.61 1.000
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20733.00 IS CODE = 81
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           SUBAREA AREA (ACRES) = 64.87 SUBAREA RUNOFF (CFS) = 115.55
_____
                                                                           EFFECTIVE AREA(ACRES) = 94.59 AREA-AVERAGED Fm(INCH/HR) = 0.52
 MAINLINE TC (MIN.) = 11.00
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.76
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.656
                                                                           TOTAL AREA (ACRES) = 94.6
                                                                                                       PEAK FLOW RATE (CFS) = 169.46
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           Ар
                                                   SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
     LAND USE
 RESIDENTIAL
                                                                         "2 DWELLINGS/ACRE"
                     В
                             0.59
                                     0.75
                                            0.700
                                                  56
 NATURAL FAIR COVER
                                                                           FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
 "OPEN BRUSH"
                      B 7.70
                                     0.61
                                            1.000
                                                   66
 RESIDENTIAL
                                                                          >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                           5.46
 "5-7 DWELLINGS/ACRE" B
                                     0.75 0.500 56
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                                                           TOTAL NUMBER OF STREAMS = 3
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.789
 SUBAREA AREA (ACRES) = 13.75 SUBAREA RUNOFF (CFS) = 26.50
                                                                           TIME OF CONCENTRATION (MIN.) = 12.05
 EFFECTIVE AREA(ACRES) = 29.72 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                           RAINFALL INTENSITY (INCH/HR) = 2.51
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.76
                                                                          AREA-AVERAGED Fm(INCH/HR) = 0.52
 TOTAL AREA (ACRES) = 29.7 PEAK FLOW RATE (CFS) =
                                                    57.69
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.69
                                                                           AREA-AVERAGED Ap = 0.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           EFFECTIVE STREAM AREA(ACRES) = 94.59
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                           TOTAL STREAM AREA(ACRES) = 94.59
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE = 169.46
******************
                                                                         **********************
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20748.00 IS CODE = 54
______
                                                                           FLOW PROCESS FROM NODE 20740.00 TO NODE 20741.00 IS CODE = 21
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                           >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
_____
                                                                           >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ELEVATION DATA: UPSTREAM(FEET) = 1845.00 DOWNSTREAM(FEET) = 1815.00
                                                                         _____
 CHANNEL LENGTH THRU SUBAREA (FEET) = 848.95 CHANNEL SLOPE = 0.0353
                                                                           INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.40
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 2095.00 DOWNSTREAM(FEET) = 2070.00
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             57.69
                                                                           Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 FLOW VELOCITY (FEET/SEC.) = 13.45 FLOW DEPTH (FEET) = 0.90
                                                                           SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.865
 TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 12.05
                                                                           * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.539
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20748.00 = 3115.00 FEET.
                                                                           SUBAREA TC AND LOSS RATE DATA(AMC II):
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fр
                                                                                                                       Aр
LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
                                                                           RESIDENTIAL
                                                                           "2 DWELLINGS/ACRE" B
                                                                                                     7.73 0.75 0.700 56 11.86
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 MAINLINE Tc(MIN.) = 12.05
                                                                           SUBAREA RUNOFF (CFS) = 14.02
                                                                           TOTAL AREA(ACRES) = 7.73 PEAK FLOW RATE(CFS) = 14.02
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.515
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fp
                                                   SCS
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                           Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
      Date: 04/21/2014 File name: LR0207ZZ.RES
                                                                                Date: 04/21/2014
                                                                                              File name: LR0207ZZ.RES
```

Page 30

```
******************
 FLOW PROCESS FROM NODE 20741.00 TO NODE 20742.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2070.00 DOWNSTREAM(FEET) = 2035.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 418.24 CHANNEL SLOPE = 0.0837
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            14.02
 FLOW VELOCITY (FEET/SEC.) = 5.67 FLOW DEPTH (FEET) = 0.99
 TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 13.09
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20742.00 = 1132.64 FEET.
*******************
 FLOW PROCESS FROM NODE 20742.00 TO NODE 20742.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 13.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.393
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.91 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 4.91 SUBAREA RUNOFF (CFS) = 8.26
 EFFECTIVE AREA(ACRES) = 12.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.6 PEAK FLOW RATE (CFS) =
                                                  21.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*******************
 FLOW PROCESS FROM NODE 20742.00 TO NODE 20743.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2020.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 525.35 CHANNEL SLOPE = 0.0286
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             21.26
 FLOW VELOCITY (FEET/SEC.) = 4.24 FLOW DEPTH (FEET) = 1.42
 TRAVEL TIME (MIN.) = 2.06 Tc (MIN.) = 15.16
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20743.00 = 1657.99 FEET.
******************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20743.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

```
MAINLINE Tc(MIN.) = 15.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.192
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                          Аp
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 7.69 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 7.69
                          SUBAREA RUNOFF (CFS) = 11.54
 EFFECTIVE AREA(ACRES) = 20.33 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 20.3
                              PEAK FLOW RATE(CFS) =
                                                   30.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*****************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20744.00 IS CODE = 54
_______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 1970.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.30 CHANNEL SLOPE = 0.1007
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 30.52
 FLOW VELOCITY (FEET/SEC.) = 7.40 FLOW DEPTH (FEET) = 1.28
 TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 16.28
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20744.00 = 2154.29 FEET.
******************
 FLOW PROCESS FROM NODE 20744.00 TO NODE 20744.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.100
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Ар
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                           6.02
                                  0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 6.02 SUBAREA RUNOFF (CFS) = 8.54
 EFFECTIVE AREA(ACRES) = 26.35 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 26.4 PEAK FLOW RATE (CFS) = 37.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
FLOW PROCESS FROM NODE 20744.00 TO NODE 20745.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 31 Date: 04

Date: 04/21/2014 File name: LR0207ZZ.RES

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1920.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.30 CHANNEL SLOPE = 0.0978
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             37.38
 FLOW VELOCITY (FEET/SEC.) = 7.72 FLOW DEPTH (FEET) = 1.39
 TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 17.38
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20745.00 = 2665.59 FEET.
***********************
 FLOW PROCESS FROM NODE 20745.00 TO NODE 20745.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 17.38
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.019
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 6.61 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В 0.17
                                     0.75
                                            0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
 SUBAREA AREA (ACRES) = 6.78
                             SUBAREA RUNOFF (CFS) = 9.14
 EFFECTIVE AREA(ACRES) = 33.13 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 33.1 PEAK FLOW RATE (CFS) =
                                                 44.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20745.00 TO NODE 20746.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1920.00 DOWNSTREAM(FEET) = 1895.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 558.91 CHANNEL SLOPE = 0.0447
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             44.60
 FLOW VELOCITY (FEET/SEC.) = 3.97 FLOW DEPTH (FEET) = 0.86
 TRAVEL TIME (MIN.) = 2.34 Tc (MIN.) = 19.72
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20746.00 = 3224.50 FEET.
*******************
 FLOW PROCESS FROM NODE 20746.00 TO NODE 20746.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_______
 MAINLINE Tc(MIN.) = 19.72
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.871
 SUBAREA LOSS RATE DATA (AMC II):
```

RESIDENTIAL "3-4 DWELLINGS/ACRE" RESIDENTIAL "2 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU		0.76	0.75	0.600	56
"2 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU	В				
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H	S LOSS RA'S AREA FRA 9.71 42.8	TE, Fp(IN ACTION, A SUBARE 4 AREA-	CH/HR) = 0 p = 0.692 A RUNOFF(CF AVERAGED Fm	.75 S) = 11. (INCH/HR)	83
TOTAL AREA (ACRES) =	42.8	PEAK	veraged ap FLOW RATE(	= 0.70 CFS) =	52.03
SUBAREA AREA-AVERAGED R 5M = 0.36; 30M = 0.73;  ***********************************	1HR = 0.9	6; 3HR =	1.64; 6HR =	*****	*****
>>>>COMPUTE TRAPEZOIDA					
>>>>TRAVELTIME THRU SU	BAREA (EX	ISTING EL	EMENT) <<<<		
ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.04 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 1 LONGEST FLOWPATH FROM N  ***********************************	AREA (FEET, 0.00 ": 5 MAXIMI EA (CFS) = ) = 5.5: .72 Tc (10 ODE 2074) ************* 20747.00	) = 573 Z" FACTOR JM DEPTH( 52. 5 FLOW MIN.) = 0.00 TO N ********* TO NODE	.14 CHANN = 15.000 FEET) = 2 03 DEPTH(FEET) 21.45 ODE 20747.	EL SLOPE = .00 = 0.79 00 = 37 **********	0.0960 97.64 FEET.
>>>>ADDITION OF SUBARE					
MAINLINE TC(MIN.) = 2 * 100 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL	ENSITY(ING AMC II): SCS SOIL	AREA	Fp	Ap (DECIMAL)	SCS CN
"3-4 DWELLINGS/ACRE" RESIDENTIAL	В	0.57	0.75	0.600	56
"2 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H TOTAL AREA(ACRES) =	S LOSS RA'S AREA FRA 10.18 53.02 R) = 0.75	TE, Fp(IN ACTION, A SUBARE AREA- AREA-A	CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED Fm VERAGED Ap	.75 S) = 11. (INCH/HR) = = 0.70	55 = 0.52
SUBAREA AREA-AVERAGED R 5M = 0.36; 30M = 0.73;				2.29: 24H	R = 5.01
JM = 0.30; JUM = 0.73;			1.01, 0111	2,23, 2111	0.01

Date: 04/21/2014 File name: LR0207ZZ.RES Page 33 Date: 04/21/2014 File name: LR0207ZZ.RES Page 34

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                                   1031.50 31.23
                                                                                                   753.64
                                                                                                           20620.00
                                                                             1
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                                   169.46 12.05
                                                                                                  94.59
                                                                                                            20730.00
                                                                                   66.08 24.70
_____
                                                                                                    65.73 20740.00
 ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 752.37 CHANNEL SLOPE = 0.0332
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                           UNIT-HYDROGRAPH DATA:
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           RAINFALL(INCH): 5M= 0.40;30M= 0.81;1H= 1.06;3H= 1.82;6H= 2.54;24H= 5.79
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               60.04
                                                                           S-GRAPH: VALLEY (DEV.) = 76.6%; VALLEY (UNDEV.) / DESERT= 23.4%
 FLOW VELOCITY (FEET/SEC.) = 3.85 FLOW DEPTH (FEET) = 1.02
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 TRAVEL TIME (MIN.) = 3.26 Tc (MIN.) = 24.70
                                                                           Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.47; Ybar = 0.48
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20748.00 = 4550.01 FEET.
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                           DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 914.0
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                            EQUIVALENT BASIN FACTOR APPROXIMATIONS:
_____
                                                                            Lca/L=0.3,n=.0391; Lca/L=0.4,n=.0350; Lca/L=0.5,n=.0322; Lca/L=0.6,n=.0300
                                                                           TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 240.33
 MAINLINE Tc(MIN.) = 24.70
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.635
                                                                           PEAK FLOW RATE (CFS) = 956.94
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             (UPSTREAM NODE PEAK FLOW RATE(CFS) = 1031.50)
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                           PEAK FLOW RATE (CFS) USED = 1031.50
                                   Fp
                                            Дp
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         ******************
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В 8.54
                                     0.75
                                             0.700
                                                   56
                                                                           FLOW PROCESS FROM NODE 20748.00 TO NODE 20749.00 IS CODE = 54
 RESIDENTIAL
                                                                          ______
 "3-4 DWELLINGS/ACRE"
                             2.23
                                     0.75
                                             0.600
                      В
                                                    56
                                                                           >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                             0.78
 PUBLIC PARK
                      В
                                     0.75
                                             0.850
                                                   56
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 RESIDENTIAL
                                                                         _____
 "5-7 DWELLINGS/ACRE"
                             1.16
                                     0.75 0.500 56
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1815.00 DOWNSTREAM(FEET) = 1700.00
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 2764.03 CHANNEL SLOPE = 0.0416
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
                                                                           CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 SUBAREA AREA(ACRES) = 12.71
                             SUBAREA RUNOFF (CFS) = 12.94
                                                                           MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 EFFECTIVE AREA(ACRES) = 65.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                           FLOW VELOCITY (FEET/SEC.) = 29.50 FLOW DEPTH (FEET) = 2.64
 TOTAL AREA (ACRES) = 65.7
                                                                           TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 32.79
                            PEAK FLOW RATE(CFS) =
                                                    66.08
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14662.13 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                           FLOW PROCESS FROM NODE 20749.00 TO NODE 20749.00 IS CODE = 81
*********************
                                                                         ______
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         ______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                           MAINLINE Tc (MIN.) = 32.79
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                           * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.379
_____
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 TOTAL NUMBER OF STREAMS = 3
                                                                           DEVELOPMENT TYPE/
                                                                                           SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                             SCS
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TIME OF CONCENTRATION (MIN.) = 24.70
                                                                           RESIDENTIAL
                                                                           "2 DWELLINGS/ACRE"
 RAINFALL INTENSITY (INCH/HR) = 1.64
                                                                                               B 46.16
                                                                                                               0.75
                                                                                                                      0.700
                                                                                                                              56
 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           RESIDENTIAL
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                           "3-4 DWELLINGS/ACRE" B 9.13
                                                                                                               0.75
                                                                                                                       0.600
                                                                                                                              56
 AREA-AVERAGED Ap = 0.69
                                                                           RESIDENTIAL
 EFFECTIVE STREAM AREA(ACRES) = 65.73
                                                                           "5-7 DWELLINGS/ACRE"
                                                                                                B 13.04
                                                                                                               0.75
                                                                                                                       0.500
                                                                                                                              56
 TOTAL STREAM AREA(ACRES) = 65.73
                                                                                                      14.63
                                                                                                               0.75
                                                                                                                       0.850
                                                                           PUBLIC PARK
                                                                                                В
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 ** CONFLUENCE DATA **
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 STREAM Q Tc
                      AREA
                                HEADWATER
                                                                           SUBAREA AREA(ACRES) = 82.96
 NUMBER (CFS) (MIN.) (ACRES)
                                                                           UNIT-HYDROGRAPH DATA:
```

Page 35

Date: 04/21/2014

File name: LR020777.RFS

Page 36

```
RAINFALL(INCH): 5M= 0.40;30M= 0.80;1H= 1.06;3H= 1.80;6H= 2.52;24H= 5.72
 S-GRAPH: VALLEY (DEV.) = 78.6%; VALLEY (UNDEV.) / DESERT= 21.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.47; Ybar = 0.49
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14662.13 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0354; Lca/L=0.4,n=.0317; Lca/L=0.5,n=.0291; Lca/L=0.6,n=.0272
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 256.42
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1014.03
                                PEAK FLOW RATE (CFS) = 1031.50
 TOTAL AREA (ACRES) = 996.9
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20749.00 TO NODE 20763.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1031.50
 FLOW VELOCITY (FEET/SEC.) = 26.71 FLOW DEPTH (FEET) = 2.83
 TRAVEL TIME (MIN.) = 1.98 Tc (MIN.) = 34.77
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.
*************************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 34.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.332
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Αp
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                                                0.500
                                                       56
                      В
                              17.57
                                        0.75
 COMMERCIAL
                               0.79
                                        0.75
                                                0.100
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                              11.86
                                        0.75
                                                0.600
                                                       56
 RESIDENTIAL
                                                0.700
 "2 DWELLINGS/ACRE"
                      В
                              51.53
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637
 SUBAREA AREA(ACRES) = 81.75
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.79;6H= 2.50;24H= 5.67
 S-GRAPH: VALLEY(DEV.) = 80.2%; VALLEY(UNDEV.) / DESERT = 19.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
```

```
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1078.7
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0323; Lca/L=0.4, n=.0289; Lca/L=0.5, n=.0266; Lca/L=0.6, n=.0248
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 273.50
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1048.92
 TOTAL AREA(ACRES) = 1078.7
                               PEAK FLOW RATE (CFS) = 1048.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
**********************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1048.92 Tc (MIN.) = 34.77
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.49
 TOTAL AREA (ACRES) = 1078.7
******************
 FLOW PROCESS FROM NODE 20750.00 TO NODE 20751.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 910.09
 ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2150.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.443
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.467
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Αp
                                                     SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
                      в 5.98
 "2 DWELLINGS/ACRE"
                                    0.75
                                             0.700
                                                      56 13.23
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.60 0.75
                                              0.600
                                                      56 12.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
 SUBAREA RUNOFF (CFS) = 15.18
 TOTAL AREA (ACRES) = 8.58 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*****************
 FLOW PROCESS FROM NODE 20751.00 TO NODE 20752.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
```

Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.47; Ybar = 0.49

Date: 04/21/2014

File name: LR020777.RFS

```
_____
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 15.93
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2120.00
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
 CHANNEL LENGTH THRU SUBAREA (FEET) = 482.67 CHANNEL SLOPE = 0.0622
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.43
 CHANNEL BASE (FEET) = 482.67 "Z" FACTOR = 2.500
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 22.72
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                               * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.719
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               15.18
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 0.89 FLOW DEPTH (FEET) = 0.04
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
 TRAVEL TIME (MIN.) = 9.03 Tc (MIN.) = 21.47
                                                                                    LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20752.00 = 1392.76 FEET.
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" B 3.61 0.75 0.600
******************
                                                                               RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                    B 21.76 0.75 0.700
 FLOW PROCESS FROM NODE 20752.00 TO NODE 20752.00 IS CODE = 81
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                               SUBAREA AREA(ACRES) = 25.37
                                                                                                            SUBAREA RUNOFF (CFS) = 27.55
                                                                               EFFECTIVE AREA(ACRES) = 38.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
 MAINLINE Tc(MIN.) = 21.47
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.779
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              qΑ
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 "3-4 DWELLINGS/ACRE" B 0.44
                                        0.75 0.600 56
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                     B 4.07 0.75 0.700 56
 "2 DWELLINGS/ACRE"
                                                                               DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               FLOW VELOCITY (FEET/SEC.) = 6.01 DEPTH*VELOCITY (FT*FT/SEC.) = 2.96
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA(ACRES) = 4.51 SUBAREA RUNOFF(CFS) = 5.12
                                                                                     AND L = 408.2 FT WITH ELEVATION-DROP = 20.0 FT, IS 59.9 CFS,
 EFFECTIVE AREA(ACRES) = 13.09 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                     WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20753.00
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                               LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20753.00 = 1800.93 FEET.
 TOTAL AREA (ACRES) = 13.1 PEAK FLOW RATE (CFS) =
                                                                              ******************
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                FLOW PROCESS FROM NODE 20753.00 TO NODE 20754.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              _______
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                              ______
 FLOW PROCESS FROM NODE 20752.00 TO NODE 20753.00 IS CODE = 63
                                                                               UPSTREAM ELEVATION(FEET) = 2100.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
                                                                               STREET LENGTH (FEET) = 602.59 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 408.17 CURB HEIGHT (INCHES) = 6.0
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.97
                                                                                 ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                                                 STREET FLOW DEPTH (FEET) = 0.49
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 18.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.41
   STREET FLOW DEPTH (FEET) = 0.44
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 24.16
```

Page 39

Date: 04/21/2014

File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR0207ZZ.RES Page 40

SCS

56

41.84

```
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.657
                                                                                 RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                     B 6.15 0.75 0.600
                                                                                                       В
                                                                                                                3.45 0.75 0.600 56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.676
 "2 DWELLINGS/ACRE"
                      в 9.79
                                                                                 SUBAREA AREA (ACRES) = 40.75 SUBAREA RUNOFF (CFS) = 39.46
                                      0.75 0.700 56
                                                                                 EFFECTIVE AREA(ACRES) = 91.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.89
                                        0.75
                                                0.600 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                      B
                                0.21
                                        0.75 0.600 56
                                                                                 TOTAL AREA (ACRES) = 91.1 PEAK FLOW RATE (CFS) =
 SCHOOL
                                                                                                                                         88.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 11.89 SUBAREA RUNOFF (CFS) = 12.27
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 EFFECTIVE AREA(ACRES) = 50.35 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 50.3 PEAK FLOW RATE (CFS) =
                                                                                 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.52
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                       AND L = 704.6 FT WITH ELEVATION-DROP = 20.0 FT, IS 75.9 CFS,
                                                                                       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20755.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20755.00 = 3108.10 FEET.
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.07
                                                                                *******************
 FLOW VELOCITY (FEET/SEC.) = 7.15 DEPTH*VELOCITY (FT*FT/SEC.) = 3.58
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20754.00 = 2403.52 FEET.
                                                                                 FLOW PROCESS FROM NODE 20755.00 TO NODE 20756.00 IS CODE = 63
******************
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20754.00 TO NODE 20755.00 IS CODE = 63
______
                                                                                _____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 STREET LENGTH (FEET) = 785.85 CURB HEIGHT (INCHES) = 6.0
_____
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 704.58 CURB HEIGHT (INCHES) = 6.0
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                                                                   93.35
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
                                                                                   ***STREET FLOWING FULL***
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.67
                                                                                   STREET FLOW DEPTH (FEET) = 0.61
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 23.32
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.04
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.88
   STREET FLOW DEPTH (FEET) = 0.61
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 27.73
   HALFSTREET FLOOD WIDTH (FEET) = 23.57
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.525
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.70
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 26.10
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
                                                                                                                                 αA
                                                                                                                                        SCS
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.582
                                                                                     LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
                                                                                 "2 DWELLINGS/ACRE" B 9.12 0.75 0.700
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                        SCS
                                                                                                                                        56
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 2.57 0.75 0.600
 "2 DWELLINGS/ACRE" B
                               31.15
                                        0.75
                                                0.700 56
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 41

File name: LR0207ZZ.RES

Page 42

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 10.71
 EFFECTIVE AREA(ACRES) = 102.79 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.44
 FLOW VELOCITY(FEET/SEC.) = 8.02 DEPTH*VELOCITY(FT*FT/SEC.) = 4.89
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20756.00 = 3893.95 FEET.
*****************
 FLOW PROCESS FROM NODE 20756.00 TO NODE 20757.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 2000.00 DOWNSTREAM ELEVATION (FEET) = 1950.00
 STREET LENGTH (FEET) = 840.67 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   98.72
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.14
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.63
                                                                                  RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.20
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 29.36
                                                                                  RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.474
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                  Aр
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                      в 8.65 0.75
                                                 0.700
 "2 DWELLINGS/ACRE"
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       B
                              2.04
                                       0.75
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
 SUBAREA AREA (ACRES) = 10.69 SUBAREA RUNOFF (CFS) = 9.28
 EFFECTIVE AREA(ACRES) = 113.48 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 113.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 23.14 FLOW VELOCITY (FEET/SEC.) = 8.62 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.20 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20757.00 = 4734.62 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20757.00 TO NODE 20758.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA >>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1920.00 STREET LENGTH (FEET) = 946.77 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.99 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.71HALFSTREET FLOOD WIDTH (FEET) = 28.51 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.30PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 5.18 STREET FLOW TRAVEL TIME (MIN.) = 2.16 Tc (MIN.) = 31.52 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.413 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN "2 DWELLINGS/ACRE" B 50.96 0.75 0.700 56 "3-4 DWELLINGS/ACRE" В 11.45 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682 SUBAREA AREA (ACRES) = 62.41 SUBAREA RUNOFF (CFS) = 50.71 EFFECTIVE AREA(ACRES) = 175.89 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68 TOTAL AREA (ACRES) = 175.9 PEAK FLOW RATE (CFS) = 143.05 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 30.16 FLOW VELOCITY (FEET/SEC.) = 7.56 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.62 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 946.8 FT WITH ELEVATION-DROP = 30.0 FT, IS 108.0 CFS,

File name: LR0207ZZ.RES

Page 44

Date: 04/21/2014

```
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20758.00
                                                                                >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20758.00 = 5681.39 FEET.
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1875.00
DOWNSTREAM NODE ELEVATION (FEET) = 1845.00
 FLOW PROCESS FROM NODE 20758.00 TO NODE 20759.00 IS CODE = 63
                                                                                FLOW LENGTH (FEET) = 1440.55 MANNING'S N = 0.013
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                DEPTH OF FLOW IN 57.0 INCH PIPE IS 27.0 INCHES
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
PIPE-FLOW VELOCITY (FEET/SEC.) = 18.08
 UPSTREAM ELEVATION(FEET) = 1920.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
                                                                                PIPE-FLOW(CFS) = 149.67
 STREET LENGTH (FEET) = 1200.03 CURB HEIGHT (INCHES) = 6.0
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 STREET HALFWIDTH (FEET) = 18.00
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 35.29
                                                                                LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20760.00 = 8321.97 FEET.
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              ******************
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                FLOW PROCESS FROM NODE 20760.00 TO NODE 20760.00 IS CODE = 81
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                MAINLINE Tc(MIN.) = 35.29
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.320
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp Ap
                                                                                                                                     SCS
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 151.26
                                                                                    LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   ***STREET FLOWING FULL***
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                    B 47.33
                                                                                                                              0.700
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                                                      0.75
                                                                                                                                      56
   STREET FLOW DEPTH (FEET) = 0.74
                                                                                RESIDENTIAL
   HALFSTREET FLOOD WIDTH (FEET) = 29.79
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                    B 8.18 0.75
                                                                                                                              0.600
                                                                                                                                      56
                                                                                                             1.84
                                                                                                                              0.850
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.18
                                                                                PUBLIC PARK
                                                                                                      В
                                                                                                                      0.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.02
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 33.96
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.351
                                                                                SUBAREA AREA(ACRES) = 57.35
                                                                                                             SUBAREA RUNOFF (CFS) = 41.47
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                EFFECTIVE AREA(ACRES) = 254.99 AREA-AVERAGED Fm(INCH/HR) = 0.51
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                TOTAL AREA(ACRES) = 255.0
                                                                                                               PEAK FLOW RATE (CFS) = 185.67
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 18.41 0.75
                                             0.700
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 "3-4 DWELLINGS/ACRE" B 3.34
                                     0.75 0.600
                                                                              ********************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
                                                                                FLOW PROCESS FROM NODE 20760.00 TO NODE 20761.00 IS CODE = 42
 SUBAREA AREA(ACRES) = 21.75
                            SUBAREA RUNOFF (CFS) = 16.42
 EFFECTIVE AREA(ACRES) = 197.64 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 TOTAL AREA (ACRES) = 197.6 PEAK FLOW RATE (CFS) = 149.67
                                                                              ______
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1845.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1770.00
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                FLOW LENGTH (FEET) = 1840.39 MANNING'S N = 0.013
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH (FEET) = 0.73 HALFSTREET FLOOD WIDTH (FEET) = 29.67
                                                                                DEPTH OF FLOW IN 57.0 INCH PIPE IS 25.2 INCHES
 FLOW VELOCITY (FEET/SEC.) = 8.16 DEPTH*VELOCITY (FT*FT/SEC.) = 5.99
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 24.51
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20759.00 = 6881.42 FEET.
                                                                                PIPE-FLOW(CFS) = 185.67
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
PIPEFLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 36.54
                                                                                LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20761.00 = 10162.36 FEET.
 FLOW PROCESS FROM NODE 20759.00 TO NODE 20760.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 45 Date: 04/21/2014 File name: LR0207ZZ.RES Page 46

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 18.99
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.48
  HALFSTREET FLOOD WIDTH (FEET) = 16.01
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.45
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.65
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20762.00 = 11735.16 FEET.
******************
 FLOW PROCESS FROM NODE 20762.00 TO NODE 20763.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1740.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1727.01 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 23.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 33.97
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 38.83
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20763.00 = 13462.17 FEET.
******************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.246
 SUBAREA LOSS RATE DATA (AMC II):
                     SCS SOIL AREA
                                      Fр
                                               Aр
                                                     SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                             19.08
                                       0.75
                                               0.500
                                                      56
                           133.50
                                       0.75
                                               0.700
                                                      56
                           16.16
                                       0.75
                                               0.600
                       B 11.70
                                       0.75
                                               0.100
                                                      56
                             5.20
                                               0.250
                                       0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA (ACRES) = 185.64 SUBAREA RUNOFF (CFS) = 130.73
 EFFECTIVE AREA(ACRES) = 550.66 AREA-AVERAGED Fm(INCH/HR) = 0.49
```

5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

STREET CROSS-SECTION INFORMATION:

Date: 04/21/2014

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) =
                  550.7 PEAK FLOW RATE(CFS) =
                                                    372.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
************************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 1
_____
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 38.83
 RAINFALL INTENSITY (INCH/HR) = 1.25
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 550.66
 TOTAL STREAM AREA(ACRES) = 550.66
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 372.44
 ** CONFLUENCE DATA **
                TC AREA HEADWATER
 STREAM
        0
 NUMBER (CFS) (MIN.) (ACRES)
                               NODE
         1048.92 34.77 1078.67 20620.00
   1
        372.44 38.83 550.66 20750.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.02;3H= 1.75;6H= 2.44;24H= 5.46
 S-GRAPH: VALLEY(DEV.) = 86.9%; VALLEY(UNDEV.) / DESERT= 13.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.48; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1629.3
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0323; Lca/L=0.4, n=.0289; Lca/L=0.5, n=.0266; Lca/L=0.6, n=.0248
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 385.43
 PEAK FLOW RATE(CFS) = 1495.29
******************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20764.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 3292.21 CHANNEL SLOPE = 0.0273
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1495.29
 FLOW VELOCITY (FEET/SEC.) = 27.67 FLOW DEPTH (FEET) = 3.27
 TRAVEL TIME (MIN.) = 1.98 Tc (MIN.) = 36.75
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
```

FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 36.75\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.288 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 27.93 0.75 0.600 В 2.86 0.75 MOBILE HOME PARK 0.250 56 RESIDENTIAL B 36.04 0.75 0.700 "2 DWELLINGS/ACRE" PUBLIC PARK 0.07 0.75 0.850 56 В COMMERCIAL В 0.16 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.638 SUBAREA AREA(ACRES) = 67.06 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.74;6H= 2.44;24H= 5.44 S-GRAPH: VALLEY(DEV.) = 87.4%; VALLEY(UNDEV.) / DESERT= 12.6% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.48; Ybar = 0.51 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92; 3HR = 0.99; 6HR = 0.99; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1696.4 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0298; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246; Lca/L=0.6,n=.0229 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 399.35 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1457.51 TOTAL AREA (ACRES) = 1696.4 PEAK FLOW RATE (CFS) = 1495.29NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 152 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 20764.DNA \_\_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 1696.4 TC (MIN.) = AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.51PEAK FLOW RATE (CFS) = 1495.29\_\_\_\_\_ \_\_\_\_\_ END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Date: 04/21/2014 File name: LR0207ZZ.RES Page 49 Date: 04/21/2014 File name: LR0207ZZ.RES Page 50

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2012 Advanced Engineering Software (aes) Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20852

\* 100-YR HC ULTIMATE CONDITION OCT 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0208ZZ.DAT

TIME/DATE OF STUDY: 08:09 11/19/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION: \_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.1910

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 0.67 2.00 0.0312 0.167 0.0180 20.0 0.020/0.020/0.020 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 10.0 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.00 TO NODE 20800.50 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 706.90 ELEVATION DATA: UPSTREAM(FEET) = 2210.00 DOWNSTREAM(FEET) = 2170.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.095 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.470 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" 6.13 0.75 0.700 56 10.73 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 2.48 0.75 0.600 56 10.09 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.671 SUBAREA RUNOFF (CFS) = 23.00TOTAL AREA (ACRES) = 8.61 PEAK FLOW RATE(CFS) = 23.00 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 3.59 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.50 TO NODE 20801.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2160.00 STREET LENGTH (FEET) = 371.36 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00

File name: LR020877.RFS

Page 2

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.41
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.17
 STREET FLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 11.50
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.209
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.82 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.32 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
 SUBAREA AREA (ACRES) = 6.14 SUBAREA RUNOFF (CFS) = 14.93
 EFFECTIVE AREA(ACRES) = 14.75 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 14.8 PEAK FLOW RATE (CFS) = 35.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 3.59
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.56
 FLOW VELOCITY (FEET/SEC.) = 4.71 DEPTH*VELOCITY (FT*FT/SEC.) = 2.41
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20801.00 = 1078.26 FEET.
*********************
 FLOW PROCESS FROM NODE 20801.00 TO NODE 20802.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2160.00 DOWNSTREAM ELEVATION(FEET) = 2153.00
 STREET LENGTH (FEET) = 226.34 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.29
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.77
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 12.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.095
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.63 0.75 0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.58 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 6.21 SUBAREA RUNOFF (CFS) = 14.41
 EFFECTIVE AREA(ACRES) = 20.96 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 21.0 PEAK FLOW RATE(CFS) = 48.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.15
 FLOW VELOCITY (FEET/SEC.) = 5.51 DEPTH*VELOCITY (FT*FT/SEC.) = 2.99
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20802.00 = 1304.60 FEET.
******************
 FLOW PROCESS FROM NODE 20802.00 TO NODE 20803.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2153.00 DOWNSTREAM ELEVATION(FEET) = 2138.00
 STREET LENGTH (FEET) = 346.96 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     52.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 4

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

```
STREET FLOW DEPTH(FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.35
 STREET FLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 13.13
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.964
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                        Fρ
                                                 Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 3.18 0.75 0.700
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.51 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 3.69 SUBAREA RUNOFF (CFS) = 8.14
 EFFECTIVE AREA(ACRES) = 24.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 24.7 PEAK FLOW RATE (CFS) = 54.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.78
 FLOW VELOCITY (FEET/SEC.) = 6.36 DEPTH*VELOCITY (FT*FT/SEC.) = 3.41
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20803.00 = 1651.56 FEET.
******************
 FLOW PROCESS FROM NODE 20803.00 TO NODE 20804.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2138.00 DOWNSTREAM ELEVATION(FEET) = 2133.00
 STREET LENGTH (FEET) = 266.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.15
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.32
 STREET FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 13.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.853
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                                        SCS
                                        Fρ
                                                 αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 12.65 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.45 0.75 0.600
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 14.10 SUBAREA RUNOFF (CFS) = 29.66
 EFFECTIVE AREA(ACRES) = 38.75 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 38.8 PEAK FLOW RATE (CFS) = 81.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43: 30M = 0.87: 1HR = 1.15: 3HR = 1.96: 6HR = 2.75: 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.68 HALFSTREET FLOOD WIDTH (FEET) = 26.80
 FLOW VELOCITY (FEET/SEC.) = 5.41 DEPTH*VELOCITY (FT*FT/SEC.) = 3.66
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 266.3 FT WITH ELEVATION-DROP = 5.0 FT, IS 42.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20804.00
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20804.00 = 1917.82 FEET.
******************
 FLOW PROCESS FROM NODE 20804.00 TO NODE 20805.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2133.00 DOWNSTREAM ELEVATION(FEET) = 2128.00
 STREET LENGTH (FEET) = 315.22 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   91.73
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
 STREET FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 15.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.737
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL.
 "2 DWELLINGS/ACRE" B
                                7.96
                                         0.75
                                                 0.700
       Date: 04/21/2014 File name: LR0208ZZ.RES
                                                       Page 6
```

```
RESIDENTIAL.
                                                                                    ".4 DWELLING/ACRE"
                                                                                                        в 0.22 0.75 0.900 56
 "3-4 DWELLINGS/ACRE" B 2.07 0.75 0.600 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
                                                                                   SUBAREA AREA (ACRES) = 50.78 SUBAREA RUNOFF (CFS) = 96.59
                                                                                   EFFECTIVE AREA(ACRES) = 99.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 SUBAREA AREA (ACRES) = 10.03 SUBAREA RUNOFF (CFS) = 20.12
 EFFECTIVE AREA(ACRES) = 48.78 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                   TOTAL AREA (ACRES) = 99.6 PEAK FLOW RATE (CFS) = 189.10
 TOTAL AREA (ACRES) = 48.8
                                PEAK FLOW RATE(CFS) =
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.89
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.73
                                                                                   FLOW VELOCITY (FEET/SEC.) = 9.54 DEPTH*VELOCITY (FT*FT/SEC.) = 7.23
 FLOW VELOCITY (FEET/SEC.) = 5.31 DEPTH*VELOCITY (FT*FT/SEC.) = 3.90
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                   *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       AND L = 315.2 FT WITH ELEVATION-DROP = 5.0 FT, IS 28.1 CFS,
                                                                                         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20805.00
                                                                                   SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20805.00 = 2233.04 FEET.
                                                                                   ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                   ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
*****************
                                                                                   ASSUME FULL-FLOWING PIPELINE
  FLOW PROCESS FROM NODE 20805.00 TO NODE 20806.00 IS CODE = 63
                                                                                   PIPE-FLOW VELOCITY (FEET/SEC.) = 14.63
______
                                                                                   PIPE-FLOW(CFS) =
                                                                                                     46.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 15.70
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.662
                                                                                   SUBAREA AREA (ACRES) = 50.78 SUBAREA RUNOFF (CFS) = 98.64
______
                                                                                   TOTAL AREA (ACRES) = 99.6 PEAK FLOW RATE (CFS) = 193.11
 UPSTREAM ELEVATION(FEET) = 2128.00 DOWNSTREAM ELEVATION(FEET) = 2098.00
 STREET LENGTH (FEET) = 616.63 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 147.11
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 28.02
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.95
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.27
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                                                   LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20806.00 = 2849.67 FEET.
                                                                                  ******************
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 146.04
   ***STREET FLOWING FULL***
                                                                                   FLOW PROCESS FROM NODE 20806.00 TO NODE 20807.00 IS CODE = 63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.70
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
   HALFSTREET FLOOD WIDTH (FEET) = 27.96
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  _____
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.24
                                                                                   UPSTREAM ELEVATION(FEET) = 2098.00 DOWNSTREAM ELEVATION(FEET) = 2090.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 16.15
                                                                                   STREET LENGTH (FEET) = 573.68 CURB HEIGHT (INCHES) = 6.0
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.618
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                      Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
      LAND USE
 RESIDENTIAL
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "2 DWELLINGS/ACRE"
                      в 36.94
                                         0.75
                                                  0.700 56
 SCHOOL
                                3.99
                                          0.75
                                                  0.600
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 RESIDENTIAL
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 "3-4 DWELLINGS/ACRE"
                     В 9.63
                                          0.75
                                                 0.600
                                                        56
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 RESIDENTIAL
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 7 Date:

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.63
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.94
 HALFSTREET FLOOD WIDTH (FEET) = 40.23
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.97
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.64
STREET FLOW TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 17.30
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.512
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"2 DWELLINGS/ACRE"
                               2.85
                                          0.75
                                                   0.700
RESIDENTIAL
                                                0.600 56
"3-4 DWELLINGS/ACRE"
                    B 1.45
                                       0.75
                       В
                                0.68
                                       0.75 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
SUBAREA AREA (ACRES) = 4.98 SUBAREA RUNOFF (CFS) = 9.05
EFFECTIVE AREA(ACRES) = 104.54 AREA-AVERAGED Fm(INCH/HR) = 0.51
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
TOTAL AREA (ACRES) = 104.5 PEAK FLOW RATE (CFS) = 193.11
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 39.86
FLOW VELOCITY (FEET/SEC.) = 5.94 DEPTH*VELOCITY (FT*FT/SEC.) = 5.57
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 9.69
PIPE-FLOW(CFS) = 57.58
PIPEFLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 16.69
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.567
SUBAREA AREA(ACRES) = 4.98 SUBAREA RUNOFF(CFS) = 9.30
TOTAL AREA (ACRES) = 104.5 PEAK FLOW RATE (CFS) = 193.84
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 136.26
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.83
 HALFSTREET FLOOD WIDTH (FEET) = 34.74
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.48
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.57
LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20807.00 = 3423.35 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 2090.00 DOWNSTREAM ELEVATION(FEET) = 2070.00
STREET LENGTH (FEET) = 620.19 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.83
 HALFSTREET FLOOD WIDTH (FEET) = 34.37
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.29
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.86
STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 17.93
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.458
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"2 DWELLINGS/ACRE"
                      B 8.19 0.75 0.700
                                                            56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.94 0.75 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
SUBAREA AREA (ACRES) = 9.13 SUBAREA RUNOFF (CFS) = 15.96
EFFECTIVE AREA(ACRES) = 113.67 AREA-AVERAGED Fm(INCH/HR) = 0.51
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
TOTAL AREA (ACRES) = 113.7 PEAK FLOW RATE (CFS) = 199.57
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 34.25
FLOW VELOCITY (FEET/SEC.) = 8.25 DEPTH*VELOCITY (FT*FT/SEC.) = 6.81
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.82
      Date: 04/21/2014
                       File name: LR0208ZZ.RES
                                                          Page 10
```

\*

FLOW PROCESS FROM NODE 20807.00 TO NODE 20808.00 IS CODE = 63

```
PIPE-FLOW(CFS) =
                  67.90
 PIPEFLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 17.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.500
 SUBAREA AREA(ACRES) = 9.13 SUBAREA RUNOFF(CFS) = 16.30
 TOTAL AREA (ACRES) = 113.7 PEAK FLOW RATE (CFS) = 203.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 135.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.49
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20808.00 = 4043.54 FEET.
****************
 FLOW PROCESS FROM NODE 20808.00 TO NODE 20809.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2070.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 545.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 224.41
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 12.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.14
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 18.15
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.440
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                  αA
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 20.40
                                          0.75
                                                  0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                               3.29
                                       0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 23.69 SUBAREA RUNOFF (CFS) = 41.09
 EFFECTIVE AREA(ACRES) = 137.36 AREA-AVERAGED Fm(INCH/HR) = 0.51
```

```
TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) =
                                                            238.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.91
 FLOW VELOCITY (FEET/SEC.) = 12.82 DEPTH*VELOCITY (FT*FT/SEC.) = 9.46
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.84
 PIPE-FLOW(CFS) = 147.68
 PIPEFLOW TRAVEL TIME (MIN.) = 0.37 Tc(MIN.) = 17.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.469
 SUBAREA AREA (ACRES) = 23.69 SUBAREA RUNOFF (CFS) = 41.70
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) = 242.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 94.73
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 21.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.53
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20809.00 = 4588.54 FEET.
*************************
 FLOW PROCESS FROM NODE 20809.00 TO NODE 20810.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2010.00
 STREET LENGTH (FEET) = 570.75 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68

Date: 04/21/2014 File name: LR0208ZZ.RES Page 11

File name: LR0208ZZ.RES

Date: 04/21/2014

```
STREET FLOW DEPTH(FEET) = 0.99
                                                                                      UPSTREAM ELEVATION(FEET) = 2010.00 DOWNSTREAM ELEVATION(FEET) = 1970.00
   HALFSTREET FLOOD WIDTH (FEET) = 42.61
                                                                                      STREET LENGTH (FEET) = 617.03 CURB HEIGHT (INCHES) = 6.0
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.89
                                                                                      STREET HALFWIDTH (FEET) = 18.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.84
 STREET FLOW TRAVEL TIME (MIN.) = 1.38 Tc (MIN.) = 19.18
                                                                                      DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.361
                                                                                      INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fp
                                                   ąς
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
     LAND USE
                                                                                      STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        B 12.89 0.75 0.700 56
                                                                                      Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                      Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.65 0.75 0.600 56
                                                                                      MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
                                                                                        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SUBAREA AREA (ACRES) = 15.54 SUBAREA RUNOFF (CFS) = 25.88
                                                                                        ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 152.90 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                        STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                        STREET FLOW DEPTH (FEET) = 0.83
 TOTAL AREA (ACRES) = 152.9 PEAK FLOW RATE (CFS) = 254.91
                                                                                        HALFSTREET FLOOD WIDTH (FEET) = 34.61
                                                                                        AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                        PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.83
                                                                                      STREET FLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 19.35
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
                                                                                      * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.348
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 42.55
                                                                                       DEVELOPMENT TYPE/ SCS SOIL AREA
 FLOW VELOCITY (FEET/SEC.) = 6.90 DEPTH*VELOCITY (FT*FT/SEC.) = 6.84
                                                                                           LAND USE
                                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      RESIDENTIAL
                                                                                      "2 DWELLINGS/ACRE"
                                                                                                            B 30.03 0.75
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                      RESIDENTIAL
                                                                                      "3-4 DWELLINGS/ACRE" B 5.60 0.75 0.600
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                                             B
                                                                                      PUBLIC PARK
 ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
                                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.94
                                                                                      SUBAREA AREA (ACRES) = 35.75 SUBAREA RUNOFF (CFS) = 59.08
 PIPE-FLOW(CFS) = 175.31
                                                                                      EFFECTIVE AREA(ACRES) = 188.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
 PIPEFLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 18.48
                                                                                      AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.414
                                                                                      TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = 312.24
 SUBAREA AREA (ACRES) = 15.54 SUBAREA RUNOFF (CFS) = 26.62
 TOTAL AREA(ACRES) = 152.9 PEAK FLOW RATE(CFS) = 262.21
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
                                                                                      END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 35.59
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.91
                                                                                      FLOW VELOCITY (FEET/SEC.) = 11.98 DEPTH*VELOCITY (FT*FT/SEC.) = 10.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                      *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   STREET FLOW DEPTH(FEET) = 0.70
                                                                                             THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 27.84
                                                                                      SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                       ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.35
                                                                                      ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.73
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20810.00 = 5159.29 FEET.
                                                                                      ASSUME FULL-FLOWING PIPELINE
                                                                                      PIPE-FLOW VELOCITY(FEET/SEC.) = 23.34
*****************
                                                                                      PIPE-FLOW(CFS) = 193.82
 FLOW PROCESS FROM NODE 20810.00 TO NODE 20811.00 IS CODE = 63
                                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 18.92
                                                                                      * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.380
                                                                                      SUBAREA AREA (ACRES) = 35.75 SUBAREA RUNOFF (CFS) = 60.10
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                      TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = 317.65
```

Date: 04/21/2014 File name: LR0208ZZ.RES Date: 04/21/2014 File name: LR0208ZZ.RES Page 14 Page 13

291.75

0.700

0.75 0.850

0.12

SCS

56

56

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 123.83
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.85
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.47
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.03
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20811.00 = 5776.32 FEET.
FLOW PROCESS FROM NODE 20811.00 TO NODE 20812.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1910.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1453.09 CHANNEL SLOPE = 0.0413
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 317.65
 FLOW VELOCITY (FEET/SEC.) = 4.69 FLOW DEPTH (FEET) = 1.16
 TRAVEL TIME (MIN.) = 5.17 Tc (MIN.) = 24.09
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20812.00 = 7229.41 FEET.
******************
 FLOW PROCESS FROM NODE 20812.00 TO NODE 20812.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 24.09
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.059
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                              aρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              6.60
                                      0.75
                                              0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.55
                                      0.75
                                              0.600 56
                          18.85
 PUBLIC PARK
                     В
                                      0.75
                                              0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
 SUBAREA AREA (ACRES) = 26.00 SUBAREA RUNOFF (CFS) = 34.07
 EFFECTIVE AREA(ACRES) = 214.65 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 214.6
                             PEAK FLOW RATE(CFS) = 317.65
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20812.00 TO NODE 20813.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1870.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1523.12 CHANNEL SLOPE = 0.0263
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             317.65
 FLOW VELOCITY (FEET/SEC.) = 3.94 FLOW DEPTH (FEET) = 1.27
 TRAVEL TIME (MIN.) = 6.44 Tc (MIN.) = 30.53
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20813.00 = 8752.53 FEET.
******************
 FLOW PROCESS FROM NODE 20813.00 TO NODE 20813.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 30.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.786
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 PUBLIC PARK
                     В
                            80.80
                                      0.75
                                             0.850
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                          130.26
                                      0.75
                                             0.700
                                                    56
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE"
                      B 24.87
                                      0.75
                                             0.600
                                                    56
 RESIDENTIAL
                      B 2.88
                                      0.75
                                             0.900
 ".4 DWELLING/ACRE"
                                                    56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            0.24
                                     0.61 1.000
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743
 SUBAREA AREA(ACRES) = 239.05
                             SUBAREA RUNOFF (CFS) = 264.79
 EFFECTIVE AREA(ACRES) = 453.70 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 453.7
                              PEAK FLOW RATE(CFS) =
                                                   509.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
***********************
 FLOW PROCESS FROM NODE 20813.00 TO NODE 20814.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1870.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1800.00
 FLOW LENGTH (FEET) = 1542.94 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 63.0 INCH PIPE IS 42.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 32.47
 PIPE-FLOW(CFS) = 509.30
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 31.32
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 15 Date: 04/21/2014 File name: LR0208ZZ.RES Page 16

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 169.73
                              SUBAREA RUNOFF (CFS) = 184.03
 EFFECTIVE AREA(ACRES) = 700.00 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.71
 TOTAL AREA(ACRES) = 700.0
                               PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.44; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20815.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
______
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.87;1H= 1.15;3H= 1.96;6H= 2.73;24H= 5.46
 S-GRAPH: VALLEY(DEV.) = 99.5%; VALLEY(UNDEV.) / DESERT = 0.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.54; LAG(HR) = 0.43; Fm(INCH/HR) = 0.53; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 700.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20815.00 = 12264.06 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0414; Lca/L=0.4, n=.0371; Lca/L=0.5, n=.0341; Lca/L=0.6, n=.0318
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 153.93
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 805.47
 TOTAL PEAK FLOW RATE (CFS) = 805.47 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 751.45
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 751.45)
 PEAK FLOW RATE (CFS) USED = 805.47
*******************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20816.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00
 FLOW LENGTH (FEET) = 1236.10 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT (FEET) = 3.00 ESTIMATED BOX BASEWIDTH (FEET) = 13.33
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 20.14
 BOX-FLOW(CFS) = 805.47
 BOX-FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 33.37
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
******************
 FLOW PROCESS FROM NODE 20816.00 TO NODE 20816.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_______
 MAINLINE Tc(MIN.) = 33.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.694
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                     SCS
       Date: 04/21/2014 File name: LR0208ZZ.RES
                                                    Page 18
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B
                               11.74
                                         0.75
                                                0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В
                              40.54
                                        0.75
                                              0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
 SUBAREA AREA(ACRES) = 52.28
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.92;6H= 2.67;24H= 5.33
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.56; LAG(HR) = 0.44; Fm(INCH/HR) = 0.53; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 752.3
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0395; Lca/L=0.4,n=.0354; Lca/L=0.5,n=.0326; Lca/L=0.6,n=.0304
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 160.19
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 825.98
 TOTAL AREA (ACRES) = 752.3
                                 PEAK FLOW RATE(CFS) =
                                                       825.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
******************
 FLOW PROCESS FROM NODE 20816.00 TO NODE 20823.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1635.00
 FLOW LENGTH (FEET) = 1150.94 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT (FEET) = 3.00 ESTIMATED BOX BASEWIDTH (FEET) = 12.53
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 21.98
 BOX-FLOW(CFS) = 825.98
 BOX-FLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 34.24
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
*******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 34.24
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.668
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fр
                                                 Aр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        В
                              8.26
                                        0.75
                                                0.700
                                                       56
 RESIDENTIAL
                              2.53
 "3-4 DWELLINGS/ACRE"
                      В
                                         0.75
                                                0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
```

```
SUBAREA AREA(ACRES) = 10.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.92;6H= 2.68;24H= 5.33
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.53; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0381; Lca/L=0.4, n=.0342; Lca/L=0.5, n=.0314; Lca/L=0.6, n=.0293
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 162.68
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                     822.10
 TOTAL AREA (ACRES) = 763.1
                                 PEAK FLOW RATE (CFS) =
                                                        825.98
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 825.98 Tc (MIN.) = 34.24
 AREA-AVERAGED Fm(INCH/HR) = 0.53 Ybar = 0.56
 TOTAL AREA (ACRES) = 763.1
******************
 FLOW PROCESS FROM NODE 20820.00 TO NODE 20821.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 724.32
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1720.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.463
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.058
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                        Fρ
                                                 Αp
                                                        SCS Tc
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                                2.07
                                         0.75
                                                0.600
                                                        56 12.46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                              6.01
                                        0.75 0.700
                                                        56 13.25
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA RUNOFF (CFS) = 18.57
 TOTAL AREA (ACRES) = 8.08 PEAK FLOW RATE (CFS) = 18.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
```

File name: LR020877.RFS

Page 20

Date: 04/21/2014

```
UPSTREAM NODE ELEVATION (FEET) = 1700.00
*********************
                                                                                    DOWNSTREAM NODE ELEVATION (FEET) = 1635.00
 FLOW PROCESS FROM NODE 20821.00 TO NODE 20822.00 IS CODE = 63
                                                                                    FLOW LENGTH (FEET) = 1753.00 MANNING'S N = 0.013
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
                                                                                    DEPTH OF FLOW IN 33.0 INCH PIPE IS 15.2 INCHES
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                    PIPE-FLOW VELOCITY(FEET/SEC.) = 16.56
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
                                                                                    PIPE-FLOW(CFS) =
                                                                                                     44.39
 STREET LENGTH (FEET) = 668.72 CURB HEIGHT (INCHES) = 6.0
                                                                                    *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 1.87 Tc (MIN.) = 16.72
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.564
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                         Fp
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                        LAND USE
                                                                                    RESIDENTIAL
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    "2 DWELLINGS/ACRE"
                                                                                                         B 28.07 0.75
                                                                                                                                    0.700
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    RESIDENTIAL
                                                                                    "3-4 DWELLINGS/ACRE" B 8.56 0.75 0.600
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                                                                                    SUBAREA AREA (ACRES) = 36.63 SUBAREA RUNOFF (CFS) = 67.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    EFFECTIVE AREA(ACRES) = 58.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
   ***STREET FLOWING FULL***
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
                                                                                    TOTAL AREA (ACRES) = 58.5 PEAK FLOW RATE (CFS) = 108.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.69
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.31
 STREET FLOW TRAVEL TIME (MIN.) = 2.38 Tc (MIN.) = 14.84
                                                                                    STREET CROSS-SECTION INFORMATION:
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.754
                                                                                    CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                  Aр
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RESIDENTIAL
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 "3-4 DWELLINGS/ACRE" B 4.10 0.75 0.600 56
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 RESIDENTIAL
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                      B 9.73 0.75 0.700 56
 "2 DWELLINGS/ACRE"
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 SUBAREA AREA (ACRES) = 13.83 SUBAREA RUNOFF (CFS) = 28.03
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 64.10
 EFFECTIVE AREA(ACRES) = 21.91 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                     ***STREET FLOWING FULL***
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TOTAL AREA (ACRES) = 21.9 PEAK FLOW RATE (CFS) = 44.39
                                                                                     STREET FLOW DEPTH(FEET) = 0.57
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 21.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.40
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.65
                                                                                    LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20823.00 = 3146.04 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  *****************
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.60
 FLOW VELOCITY (FEET/SEC.) = 5.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.81
                                                                                    FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
 LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20822.00 = 1393.04 FEET.
                                                                                    >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
*****************
                                                                                   >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 FLOW PROCESS FROM NODE 20822.00 TO NODE 20823.00 IS CODE = 33
                                                                                  ______
                                                                                    TOTAL NUMBER OF STREAMS = 2
                                                                                    CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                   TIME OF CONCENTRATION (MIN.) = 16.72
                                                                                    RAINFALL INTENSITY (INCH/HR) = 2.56
```

Page 21

Date: 04/21/2014 File name: LR0208ZZ.RES

Date: 04/21/2014 File name: LR0208ZZ.RES Page 22

56

AREA-AVERAGED Fm(INCH/HR) = 0.50	PUBLIC PARK B 0.22 0.75 0.850 56				
AREA-AVERAGED Fp(INCH/HR) = 0.75	AGRICULTURAL FAIR COVER				
AREA-AVERAGED Ap = 0.67	"ORCHARDS" B 3.67 0.63 1.000 65				
EFFECTIVE STREAM AREA(ACRES) = 58.54	SCHOOL B 0.34 0.75 0.600 56				
TOTAL STREAM AREA(ACRES) = 58.54	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74				
PEAK FLOW RATE(CFS) AT CONFLUENCE = 108.50	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683				
** CONFLUENCE DATA **	SUBAREA AREA(ACRES) = 127.38				
STREAM Q TC AREA HEADWATER	UNIT-HYDROGRAPH DATA:				
NUMBER (CFS) (MIN.) (ACRES) NODE	RAINFALL(INCH): 5M= 0.41;30M= 0.83;1H= 1.09;3H= 1.85;6H= 2.58;24H= 5.11				
1 825.98 34.24 763.07 20800.00	S-GRAPH: VALLEY(DEV.) = 99.3%; VALLEY(UNDEV.) / DESERT = 0.7%				
2 108.50 16.72 58.54 20820.00	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%				
	Tc(HR) = 0.59; LAG(HR) = 0.47; $Fm(INCH/HR) = 0.53$ ; Ybar = 0.57				
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.				
UNIT-HYDROGRAPH DATA:	DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;				
RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.92;6H= 2.68;24H= 5.34	3HR = 0.99; 6HR = 1.00; 24HR= 1.00				
S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.)/DESERT= 0.4%	UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 949.0				
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT(UNDEV.) = 0.0%	LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.				
Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.53; Ybar = 0.56	EQUIVALENT BASIN FACTOR APPROXIMATIONS:				
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.	Lca/L=0.3,n=.0366; Lca/L=0.4,n=.0328; Lca/L=0.5,n=.0302;Lca/L=0.6,n=.0281				
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;	TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 191.46				
3HR = 0.99; 6HR = 1.00; 24HR= 1.00	UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 932.15				
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 821.6	TOTAL AREA(ACRES) = 949.0 PEAK FLOW RATE(CFS) = 932.15				
LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.					
EQUIVALENT BASIN FACTOR APPROXIMATIONS:	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):				
Lca/L=0.3, n=.0381; Lca/L=0.4, n=.0342; Lca/L=0.5, n=.0314; Lca/L=0.6, n=.0293	5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59				
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 176.23					
PEAK FLOW RATE(CFS) = 884.95	*******************				
	FLOW PROCESS FROM NODE 20824.00 TO NODE 20825.00 IS CODE = 42				
********************					
FLOW PROCESS FROM NODE 20823.00 TO NODE 20824.00 IS CODE = 48	>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA				
	>>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<				
>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA					
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>	UPSTREAM NODE ELEVATION(FEET) = 1599.00				
	DOWNSTREAM NODE ELEVATION(FEET) = 1550.00				
ELEVATION DATA: UPSTREAM(FEET) = 1635.00 DOWNSTREAM(FEET) = 1599.00	FLOW LENGTH(FEET) = 1211.57 MANNING'S N = 0.013				
FLOW LENGTH(FEET) = 1479.71 MANNING'S N = 0.014					
GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00	USER SPECIFIED PIPE DIAMETER(INCH) = 81.00 NUMBER OF PIPES = 1				
*GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 16.49	DEPTH OF FLOW IN 81.0 INCH PIPE IS 54.8 INCHES				
ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.89	PIPE-FLOW VELOCITY(FEET/SEC.) = 36.20				
BOX-FLOW(CFS) = 884.95	PIPE-FLOW(CFS) = 932.15				
BOX-FLOW TRAVEL TIME (MIN.) = 1.38 Tc (MIN.) = 35.62	*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*				
LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.	PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 36.18				
***************	LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20825.00 = 17342.38 FEET.				
	***************				
FLOW PROCESS FROM NODE 20824.00 TO NODE 20824.00 IS CODE = 81					
	FLOW PROCESS FROM NODE 20825.00 TO NODE 20825.00 IS CODE = 81				
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>					
MATRITUD DE ANTW \ 25 C2	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<				
MAINLINE TC (MIN.) = $35.62$	WATER TO (MT) ) 26 10				
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.629	MAINLINE TC (MIN.) = 36.18				
SUBAREA LOSS RATE DATA (AMC II):	* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.613				
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	SUBAREA LOSS RATE DATA (AMC II):				
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS				
RESIDENTIAL	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN				
"2 DWELLINGS/ACRE" B 96.44 0.75 0.700 56	RESIDENTIAL				
RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 10.70 0.75 0.600 56				
"3-4 DWELLINGS/ACRE" B 25.64 0.75 0.600 56	RESIDENTIAL				
COMMERCIAL B 1.07 0.75 0.100 56	"2 DWELLINGS/ACRE" B 31.03 0.75 0.700 56				
Date: 04/21/2014 File name: LR0208ZZ.RES Page 23	Date: 04/21/2014 File name: LR0208ZZ.RES Page 24				

```
AGRICULTURAL FAIR COVER
 "ORCHARDS"
                       В
                              0.52
                                       0.63
                                             1.000
                              6.54
                     В
 PUBLIC PARK
                                       0.75 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
 SUBAREA AREA (ACRES) = 48.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.10;3H= 1.86;6H= 2.58;24H= 5.13
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.53; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20825.00 = 17342.38 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0352; Lca/L=0.4,n=.0316; Lca/L=0.5,n=.0290; Lca/L=0.6,n=.0271
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 202.47
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 966.46
 TOTAL AREA (ACRES) = 997.8 PEAK FLOW RATE (CFS) =
                                                      966.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20825.00 TO NODE 20826.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1535.00
 FLOW LENGTH (FEET) = 755.22 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 93.0 INCH PIPE IS 64.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 27.93
 PIPE-FLOW(CFS) = 966.46
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 36.63
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
******************
 FLOW PROCESS FROM NODE 20826.00 TO NODE 20826.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 36.63
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               qΑ
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.73 0.75
                                               0.600
                                                     56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                              0.52
                                       0.63
                                             1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA(ACRES) = 10.25
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.10;3H= 1.86;6H= 2.59;24H= 5.13
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.53; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1008.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0344; Lca/L=0.4,n=.0308; Lca/L=0.5,n=.0283; Lca/L=0.6,n=.0264
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 205.05
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 971.25
 TOTAL AREA (ACRES) = 1008.0 PEAK FLOW RATE (CFS) =
                                                       971.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20826.00 TO NODE 20827.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1500.00
 FLOW LENGTH (FEET) = 969.04 MANNING'S N = 0.013
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
 *GIVEN BOX HEIGHT(FEET) = 3.50 ESTIMATED BOX BASEWIDTH(FEET) = 11.40
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 24.34
 BOX-FLOW(CFS) = 971.25
 BOX-FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 37.29
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
******************
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20827.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 37.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.584
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Aр
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             21.08 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.08
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.86;6H= 2.59;24H= 5.14
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.52; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 25

File name: LR0208ZZ.RES

Date: 04/21/2014

Page 26

```
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1029.1
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0337; Lca/L=0.4,n=.0302; Lca/L=0.5,n=.0277; Lca/L=0.6,n=.0259
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 210.41
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 991.68
 TOTAL AREA (ACRES) = 1029.1 PEAK FLOW RATE (CFS) = 991.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20828.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1480.00
 FLOW LENGTH (FEET) = 712.41 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
 *GIVEN BOX HEIGHT (FEET) = 3.50 ESTIMATED BOX BASEWIDTH (FEET) = 13.83
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 20.48
 BOX-FLOW(CFS) = 991.68
 BOX-FLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 37.87
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
******************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20828.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 37.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.570
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 24.73
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 24.73
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.87;6H= 2.59;24H= 5.15
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.52; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1053.8
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0297; Lca/L=0.5,n=.0273; Lca/L=0.6,n=.0255
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 216.71
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1015.51
 TOTAL AREA(ACRES) = 1053.8
                             PEAK FLOW RATE (CFS) = 1015.51
```

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20829.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 766.85 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
 *GIVEN BOX HEIGHT(FEET) = 3.50 ESTIMATED BOX BASEWIDTH(FEET) = 16.58
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.50
 BOX-FLOW(CFS) = 1015.51
 BOX-FLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 38.60
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 38.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.552
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fp
                                                Дp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              13.31 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 13.31
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.87;6H= 2.60;24H= 5.15
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.52; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0327; Lca/L=0.4,n=.0294; Lca/L=0.5,n=.0270; Lca/L=0.6,n=.0252
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 220.10
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1021.35
 TOTAL AREA (ACRES) = 1067.2 PEAK FLOW RATE (CFS) = 1021.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
```

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014 File name: LR0208ZZ.RES Page 27 Date: 04/21/2014 File name: LR0208ZZ.RES Page 28

```
******************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20764.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1495.29 Tc (MIN.) = 36.75
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.51
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
*****
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1495.29 Tc (MIN.) = 36.75
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.51
 TOTAL AREA(ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
*****************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
******************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20829.00 IS CODE = 48
.....
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 1297.04 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 15.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 3.02 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 32.96
 BOX-FLOW(CFS) = 1495.29
 BOX-FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 37.41
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1495.29 Tc (MIN.) = 37.41
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.51
 TOTAL AREA(ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1021.35 Tc (MIN.) = 38.60
```

```
TOTAL AREA (ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.06;3H= 1.79;6H= 2.50;24H= 5.33
 S-GRAPH: VALLEY(DEV.) = 92.0%; VALLEY(UNDEV.) / DESERT= 8.0%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.50; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2763.5
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0291; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239; Lca/L=0.6,n=.0223
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 612.12
 PEAK FLOW RATE (CFS) = 2305.79
********************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
*************************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20852.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1413.00
 FLOW LENGTH (FEET) = 2003.77 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 24.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 3.09 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 31.12
 BOX-FLOW(CFS) = 2305.79
 BOX-FLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 38.48
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 2305.79 Tc (MIN.) = 38.48
 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.53
 TOTAL AREA(ACRES) = 2763.5
FLOW PROCESS FROM NODE 20830.00 TO NODE 20831.00 IS CODE = 21
._____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 814.59
```

Page 30

Date: 04/21/2014

Date: 04/21/2014 File name: LR0208ZZ.RES Page 29

```
ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1475.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.868
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.518
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Дp
                                                       SCS Tc
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                0.600
                     В
                                6.12
                                                       56 13.37
 COMMERCIAL
                      В
                                1.79
                                      0.75
                                                0.100
                                                      56 9.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.487
 SUBAREA RUNOFF(CFS) = 22.45
 TOTAL AREA(ACRES) = 7.91 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20831.00 TO NODE 20832.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1475.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1464.00
 FLOW LENGTH (FEET) = 301.44 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 8.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.51
 PIPE-FLOW(CFS) = 22.45
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.43 Tc (MIN.) = 10.29
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.430
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                       SCS
                                               αA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                7.31
                                         0.75 0.600 56
                                        0.75 0.100 56
 COMMERCIAL
                      В
                              3.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.434
 SUBAREA AREA (ACRES) = 10.93 SUBAREA RUNOFF (CFS) = 30.54
 EFFECTIVE AREA(ACRES) = 18.84 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 18.8 PEAK FLOW RATE (CFS) =
                                                         52.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                            STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 29.92
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.47
  HALFSTREET FLOOD WIDTH (FEET) = 17.10
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.30
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20832.00 = 1116.03 FEET.
******************
 FLOW PROCESS FROM NODE 20832.00 TO NODE 20833.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1464.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
 FLOW LENGTH (FEET) = 991.27 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 13.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.93
 PIPE-FLOW(CFS) =
                   52.37
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 11.48
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20833.00 = 2107.30 FEET.
******************
 FLOW PROCESS FROM NODE 20833.00 TO NODE 20833.00 IS CODE = 81
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 11.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.213
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αp
                                                    SCS
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                          23.09
                                     0.75 0.600
 "3-4 DWELLINGS/ACRE"
                     R
                                                    56
                            9.26
                                    0.75 0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
 SUBAREA AREA(ACRES) = 32.35 SUBAREA RUNOFF(CFS) = 83.59
 EFFECTIVE AREA(ACRES) = 51.19 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 51.2 PEAK FLOW RATE (CFS) = 132.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20833.00 TO NODE 20852.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
```

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70

Date: 04/21/2014 File name: LR0208ZZ.RES Page 31

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 32

```
>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                         UPSTREAM NODE ELEVATION (FEET) = 1440.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1413.00
 FLOW LENGTH (FEET) = 1064.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 21.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.52
 PIPE-FLOW(CFS) = 132.27
                                                                              LAND USE
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                          RESIDENTIAL
                                                                          "5-7 DWELLINGS/ACRE"
 PIPEFLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 12.44
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20852.00 = 3171.64 FEET.
                                                                          COMMERCIAL
                                                                          RESIDENTIAL
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 12.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.062
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Ар
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             2.67
                                            0.600
                      В
                                     0.75
                                                  56
 MOBILE HOME PARK
                             3.54
                    В
                                     0.75
                                          0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
                             SUBAREA RUNOFF(CFS) = 15.44
 SUBAREA AREA(ACRES) = 6.21
 EFFECTIVE AREA(ACRES) = 57.40 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) =
                  57.4
                            PEAK FLOW RATE (CFS) = 140.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 12.44
 RAINFALL INTENSITY (INCH/HR) = 3.06
 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                              LAND USE
 AREA-AVERAGED Ap = 0.45
                                                                          MOBILE HOME PARK
 EFFECTIVE STREAM AREA(ACRES) = 57.40
                                                                          RESIDENTIAL
 TOTAL STREAM AREA(ACRES) = 57.40
                                                                          "5-7 DWELLINGS/ACRE"
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 140.76
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE"
******************
                                                                          COMMERCIAL
 FLOW PROCESS FROM NODE 20840.00 TO NODE 20841.00 IS CODE = 21
                                                                          PUBLIC PARK
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
INITIAL SUBAREA FLOW-LENGTH (FEET) = 708.14
 ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1600.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.898
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.021
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                     В
                              3.00
                                              0.500
                                                     56 10.11
                                      0.75
                            5.71
                                      0.75
                                              0.100
                                                     56
                                                         7.90
 "3-4 DWELLINGS/ACRE"
                       B 1.09
                                      0.75
                                              0.600
                                                     56 10.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.278
 SUBAREA RUNOFF (CFS) = 33.63
 TOTAL AREA (ACRES) = 9.80 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20841.00 TO NODE 20842.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1580.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 218.02 CHANNEL SLOPE = 0.0917
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               33.63
 FLOW VELOCITY (FEET/SEC.) = 4.82 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 8.65
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20842.00 = 926.16 FEET.
FLOW PROCESS FROM NODE 20842.00 TO NODE 20842.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 8.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.807
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fp
                                              Αp
                                                     SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                              3.16
                                      0.75
                                              0.250
                       В
                              2.28
                                      0.75
                                              0.500
                                                     56
                       В
                              1.36
                                       0.75
                                              0.600
                                                     56
                              1.50
                                       0.75
                                              0.100
                                                     56
                       В
                              0.63
                                      0.75
                                              0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.384
 SUBAREA AREA(ACRES) = 8.93
                              SUBAREA RUNOFF (CFS) = 28.28
```

File name: LR0208ZZ.RES

Page 34

Date: 04/21/2014

Date: 04/21/2014 File name: LR020877.RFS Page 33

```
EFFECTIVE AREA(ACRES) = 18.73 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 TOTAL AREA(ACRES) = 18.7 PEAK FLOW RATE(CFS) =
                                                    60.02
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****
 FLOW PROCESS FROM NODE 20842.00 TO NODE 20843.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1560.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 248.99 CHANNEL SLOPE = 0.0803
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                              60.02
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 5.35 FLOW DEPTH (FEET) = 0.86
 TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 9.43
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20843.00 = 1175.15 FEET.
*******************
 FLOW PROCESS FROM NODE 20843.00 TO NODE 20843.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 9.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.615
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   В
                          4.09
 MOBILE HOME PARK
                                     0.75
                                            0.250
 PUBLIC PARK
                    В
                             1.15
                                     0.75
                                            0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.11
                                   0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386
 SUBAREA AREA(ACRES) = 5.35
                             SUBAREA RUNOFF (CFS) = 16.02
 EFFECTIVE AREA(ACRES) = 24.08 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 24.1
                              PEAK FLOW RATE(CFS) =
                                                    72.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20843.00 TO NODE 20844.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1560.00 DOWNSTREAM(FEET) = 1557.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 185.64 CHANNEL SLOPE = 0.0162
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             72.82
 FLOW VELOCITY (FEET/SEC.) = 3.08 FLOW DEPTH (FEET) = 1.26
```

```
TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 10.43
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20844.00 = 1360.79 FEET.
FLOW PROCESS FROM NODE 20844.00 TO NODE 20844.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 10.43
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.402
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                          2.82
                   В
                                 0.75 0.250
 MOBILE HOME PARK
                                                  56
 PUBLIC PARK
                    В
                           1.93
                                    0.75
                                           0.850
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          0.39 0.75
                                           0.600
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
 SUBAREA AREA (ACRES) = 5.14
                            SUBAREA RUNOFF (CFS) = 14.00
 EFFECTIVE AREA(ACRES) = 29.22 AREA-AVERAGED Fm(INCH/HR) = 0.28
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37
 TOTAL AREA(ACRES) = 29.2
                             PEAK FLOW RATE(CFS) =
                                                  82.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20844.00 TO NODE 20845.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1555.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 193.68 CHANNEL SLOPE = 0.0103
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            82.20
 FLOW VELOCITY (FEET/SEC.) = 2.68 FLOW DEPTH (FEET) = 1.43
 TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 11.64
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20845.00 = 1554.47 FEET.
***********************
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20845.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 11.64
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.186
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                 Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                   В
                           0.75 0.75 0.250
                                                  56
                           1.88
                                           0.850
                                                  56
 PUBLIC PARK
                      В
                                    0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                           0.24
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
```

Page 36

Date: 04/21/2014

Date: 04/21/2014 File name: LR0208ZZ.RES Page 35

```
SUBAREA AREA(ACRES) = 2.87
                            SUBAREA RUNOFF (CFS) = 6.93
 EFFECTIVE AREA(ACRES) = 32.09 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 32.1 PEAK FLOW RATE(CFS) =
                                               83.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20846.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1552.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 263.74 CHANNEL SLOPE = 0.0114
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            83.46
 FLOW VELOCITY (FEET/SEC.) = 2.78 FLOW DEPTH (FEET) = 1.41
 TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 13.22
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20846.00 = 1818.21 FEET.
*******************
 FLOW PROCESS FROM NODE 20846.00 TO NODE 20846.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.952
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                   B 0.82 0.75 0.250 56
 PUBLIC PARK
                    В
                            2.06
                                  0.75
                                           0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10
                                  0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 SUBAREA AREA (ACRES) = 2.98 SUBAREA RUNOFF (CFS) = 6.56
 EFFECTIVE AREA(ACRES) = 35.07 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
 TOTAL AREA (ACRES) = 35.1 PEAK FLOW RATE (CFS) = 83.46
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20846.00 TO NODE 20847.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1552.00 DOWNSTREAM(FEET) = 1550.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 185.20 CHANNEL SLOPE = 0.0108
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
```

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                           83.46
 FLOW VELOCITY (FEET/SEC.) = 2.74 FLOW DEPTH (FEET) = 1.42
 TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 14.34
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20847.00 = 2003.41 FEET.
FLOW PROCESS FROM NODE 20847.00 TO NODE 20847.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 14.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.811
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fρ
                                              SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                 B 2.48 0.75 0.250
 MOBILE HOME PARK
 PUBLIC PARK
                  В
                         2.79 0.75 0.850
                                               56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.16 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.569
 SUBAREA AREA (ACRES) = 5.43 SUBAREA RUNOFF (CFS) = 11.66
 EFFECTIVE AREA(ACRES) = 40.50 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44
 TOTAL AREA (ACRES) = 40.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20847.00 TO NODE 20848.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1540.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.70 CHANNEL SLOPE = 0.0269
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.93 FLOW DEPTH (FEET) = 1.24
 TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 15.92
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20848.00 = 2375.11 FEET.
******************
 FLOW PROCESS FROM NODE 20848.00 TO NODE 20848.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.640
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fp
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   LAND USE
 MOBILE HOME PARK
                  В
                         0.62 0.75
                                       0.250
 PUBLIC PARK
                  В
                         5.12 0.75
                                       0.850
                                               56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          0.12
                                  0.75 0.600
```

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 38

Date: 04/21/2014 File name: LR0208ZZ.RES Page 37

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.781
 SUBAREA AREA(ACRES) = 5.86 SUBAREA RUNOFF(CFS) = 10.84
 EFFECTIVE AREA(ACRES) = 46.36 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 46.4 PEAK FLOW RATE (CFS) =
                                               95.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20848.00 TO NODE 20849.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1540.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.67 CHANNEL SLOPE = 0.0924
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 6.31 FLOW DEPTH (FEET) = 1.00
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 16.78
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20849.00 = 2699.78 FEET.
*******************
 FLOW PROCESS FROM NODE 20849.00 TO NODE 20849.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.78
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.559
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                  B 1.44 0.75 0.850 56
                   в 0.53
                                 0.75 0.250 56
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.02 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA(ACRES) = 1.99 SUBAREA RUNOFF(CFS) = 3.66
 EFFECTIVE AREA(ACRES) = 48.35 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA(ACRES) = 48.4 PEAK FLOW RATE(CFS) =
                                                 95.32
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 20849.00 TO NODE 20850.00 IS CODE = 63
.....
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1497.00
 STREET LENGTH (FEET) = 288.19 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 112.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.11
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.29
 STREET FLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 17.37
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.506
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.94 0.75
                                                 0.600
                                                         56
 MOBILE HOME PARK B 9.09 0.75
                                                 0.250
                                                         56
 AGRICULTURAL FAIR COVER
                      B 5.99 0.63 1.000
 "ORCHARDS"
                                                         6.5
                              1.08 0.75 0.850
 PUBLIC PARK
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.572
 SUBAREA AREA (ACRES) = 18.10 SUBAREA RUNOFF (CFS) = 34.49
 EFFECTIVE AREA(ACRES) = 66.45 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.51
 TOTAL AREA (ACRES) = 66.5 PEAK FLOW RATE (CFS) = 127.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.92
 FLOW VELOCITY (FEET/SEC.) = 8.37 DEPTH*VELOCITY (FT*FT/SEC.) = 5.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 288.2 FT WITH ELEVATION-DROP = 13.0 FT, IS 70.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20850.00
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20850.00 = 2987.97 FEET.
*******************
 FLOW PROCESS FROM NODE 20850.00 TO NODE 20851.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1497.00 DOWNSTREAM ELEVATION(FEET) = 1435.00
 STREET LENGTH (FEET) = 2619.33 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
```

Page 40

Date: 04/21/2014 File name: LR0208ZZ.RES Page 39 Date: 04/21/2014 File name: LR0208ZZ.RES

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 198.34
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.87
 HALFSTREET FLOOD WIDTH (FEET) = 36.32
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.31
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.34
STREET FLOW TRAVEL TIME (MIN.) = 5.97 Tc (MIN.) = 23.34
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.099
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       Fρ
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 82.38
                                          0.75 0.600 56
                                10.87
MOBILE HOME PARK
                       В
                                        0.75
                                                  0.250
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.559
SUBAREA AREA(ACRES) = 93.25
                              SUBAREA RUNOFF (CFS) = 141.04
EFFECTIVE AREA(ACRES) = 159.70 AREA-AVERAGED Fm(INCH/HR) = 0.40
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
TOTAL AREA(ACRES) = 159.7 PEAK FLOW RATE(CFS) =
                                                            244.22
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.93 HALFSTREET FLOOD WIDTH(FEET) = 39.44
FLOW VELOCITY (FEET/SEC.) = 7.67 DEPTH*VELOCITY (FT*FT/SEC.) = 7.12
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 12.62
PIPE-FLOW(CFS) =
                   75.01
PIPEFLOW TRAVEL TIME (MIN.) = 3.46 Tc (MIN.) = 20.83
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.247
SUBAREA AREA (ACRES) = 93.25 SUBAREA RUNOFF (CFS) = 153.48
TOTAL AREA (ACRES) = 159.7 PEAK FLOW RATE (CFS) = 265.52
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 190.51
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.85
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.26
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.20
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20851.00 = 5607.30 FEET.
FLOW PROCESS FROM NODE 20851.00 TO NODE 20852.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1435.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1413.00
 FLOW LENGTH (FEET) = 1025.18 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 40.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.56
 PIPE-FLOW(CFS) = 265.52
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 21.66
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20852.00 = 6632.48 FEET.
*******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 21.66
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.195
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.28 0.75 0.600
                                                56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 12.28 SUBAREA RUNOFF(CFS) = 19.30
 EFFECTIVE AREA(ACRES) = 171.98 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
 TOTAL AREA(ACRES) = 172.0 PEAK FLOW RATE(CFS) = 277.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*********************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
.....
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.66
 RAINFALL INTENSITY (INCH/HR) = 2.19
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.54
```

HALFSTREET FLOOD WIDTH (FEET) = 35.71

Date: 04/21/2014 File name: LR0208ZZ.RES Page 41

File name: LR020877.RFS

Date: 04/21/2014

Page 42

TOTAL STREAM AREA(ACRES) = 171.98 PEAK FLOW RATE (CFS) AT CONFLUENCE = 277.33 \*\* CONFLUENCE DATA \*\* 0 Tc AREA HEADWATER STREAM NUMBER (CFS) (MIN.) (ACRES) NODE 2305.79 38.48 2763.54 20620.00 1 140.76 12.44 57.40 20830.00 3 277.33 21.66 171.98 20840.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.40;30M= 0.81;1H= 1.07;3H= 1.81;6H= 2.52;24H= 5.34 S-GRAPH: VALLEY (DEV.) = 92.4%; VALLEY (UNDEV.) / DESERT= 7.6% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.49; Ybar = 0.52 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.87; 30M = 0.87; 1HR = 0.87; 3HR = 0.98; 6HR = 0.99; 24HR = 0.99UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230; Lca/L=0.6,n=.0215 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 674.36 PEAK FLOW RATE (CFS) = 2498.67\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 152 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<< \_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 20852.DNA \_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA(ACRES) = 2992.9 TC(MIN.) = 38.48 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.52PEAK FLOW RATE (CFS) = 2498.67\_\_\_\_\_\_ \_\_\_\_\_ END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

EFFECTIVE STREAM AREA(ACRES) = 171.98

Date: 04/21/2014 File name: LR0208ZZ.RES Page 43 Date: 04/21/2014 File name: LR0208ZZ.RES Page 44

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20968

Date: 04/21/2014

HYDROLOGY - TO NODE 20968

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0209ZZ.DAT

TIME/DATE OF STUDY: 08:10 11/19/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2490

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-GEOMETRIES:			MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======		=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

File name: LR020977.RFS

Page 1

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20900.00 TO NODE 20901.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 751.64 ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1798.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.372 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.580 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αp SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL ".4 DWELLING/ACRE" В 0.85 0.75 0.900 56 12.26 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.85 0.75 0.600 56 10.37 RESIDENTIAL 8.78 0.75 0.700 "2 DWELLINGS/ACRE" R 56 11.03 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708 SUBAREA RUNOFF (CFS) = 28.78TOTAL AREA (ACRES) = 10.48 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.93; 1HR = 1.23; 3HR = 2.01; 6HR = 2.75; 24HR = 5.50FLOW PROCESS FROM NODE 20901.00 TO NODE 20902.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 File name: LR0209ZZ.RES Page 2

UPSTREAM ELEVATION(FEET) = 1798.00 DOWNSTREAM ELEVATION(FEET) = 1770.00

>>>> (STREET TABLE SECTION # 5 USED) <<<<

```
STREET LENGTH (FEET) = 427.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH(FEET) = 0.55
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 20.45
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.09
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.57
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.79
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 13.01
   STREET FLOW DEPTH (FEET) = 0.45
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.125
   HALFSTREET FLOOD WIDTH (FEET) = 16.32
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.39
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.89
                                                                                     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 11.49
                                                                                 RESIDENTIAL
                                                                                 ".4 DWELLING/ACRE" B 2.12
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.368
                                                                                                                         0.75
                                                                                                                                 0.900
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                 "3-4 DWELLINGS/ACRE" B 0.54 0.75 0.600
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 RESIDENTIAL
                                                                                 "2 DWELLINGS/ACRE" B 2.53 0.75 0.700
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 2.43
                                         0.75
                                                 0.900
                                                       56
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.771
 "3-4 DWELLINGS/ACRE" B 0.53
                                         0.75
                                                 0.600
                                                       56
                                                                                 SUBAREA AREA (ACRES) = 5.19 SUBAREA RUNOFF (CFS) = 11.90
                                                                                 EFFECTIVE AREA(ACRES) = 21.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.46 0.75 0.700 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 TOTAL AREA (ACRES) = 21.1 PEAK FLOW RATE (CFS) = 48.78
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.780
 SUBAREA AREA (ACRES) = 5.42 SUBAREA RUNOFF (CFS) = 13.58
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 40.35
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 5.19 DEPTH*VELOCITY (FT*FT/SEC.) = 2.89
                                                                                 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20903.00 = 1644.63 FEET.
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                *****************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.47 HALFSTREET FLOOD WIDTH (FEET) = 17.18
                                                                                 FLOW PROCESS FROM NODE 20903.00 TO NODE 20904.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 6.57 DEPTH*VELOCITY (FT*FT/SEC.) = 3.09
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20902.00 = 1179.32 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
*******************
                                                                                _____
 FLOW PROCESS FROM NODE 20902.00 TO NODE 20903.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 1758.00 DOWNSTREAM ELEVATION(FEET) = 1750.00
______
                                                                                 STREET LENGTH (FEET) = 486.20 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1758.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 465.31 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

46.30

56

56

Date: 04/21/2014 File name: LR0209ZZ.RES Date: 04/21/2014 File name: LR0209ZZ.RES Page 3 Page 4

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.03
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.53
 STREET FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 15.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.769
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 8.61
                                        0.75
                                                0.900
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.14
                                        0.75
                                                0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 13.33 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.763
 SUBAREA AREA (ACRES) = 24.08 SUBAREA RUNOFF (CFS) = 47.64
 EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 66.7 PEAK FLOW RATE (CFS) = 132.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.50
 FLOW VELOCITY (FEET/SEC.) = 8.99 DEPTH*VELOCITY (FT*FT/SEC.) = 6.02
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 660.5 FT WITH ELEVATION-DROP = 35.0 FT, IS 67.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20905.00
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20905.00 = 2791.34 FEET.
******************
 FLOW PROCESS FROM NODE 20905.00 TO NODE 20906.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 1223.70 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 148.00
   ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 6

Date: 04/21/2014 File name: LR0209ZZ.RES Page 5

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.67
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.92
 STREET FLOW TRAVEL TIME (MIN.) = 2.53 Tc (MIN.) = 18.45
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.535
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Aр
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В 7.55
                                        0.75
                                                0.900
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61
                                        0.75
                                                0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 8.18 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778
 SUBAREA AREA(ACRES) = 17.34 SUBAREA RUNOFF(CFS) = 30.47
 EFFECTIVE AREA(ACRES) = 84.03 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 84.0 PEAK FLOW RATE (CFS) = 149.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.73
 FLOW VELOCITY(FEET/SEC.) = 8.10 DEPTH*VELOCITY(FT*FT/SEC.) = 5.95
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20906.00 = 4015.04 FEET.
*****
 FLOW PROCESS FROM NODE 20906.00 TO NODE 20920.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 1513.04 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 164.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.59
```

```
STREET FLOW TRAVEL TIME (MIN.) = 2.80 Tc (MIN.) = 21.24
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.329
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                αA
                                                        SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.66
                                         0.75
                                                 0.600
                                                         56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В 8.47
                                                 0.700
                                         0.75
                                                         56
 AGRICULTURAL FAIR COVER
                                         0.63 1.000
                                                         65
 "ORCHARDS"
                         В
                                0.16
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 7.50 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.768
 SUBAREA AREA (ACRES) = 18.79 SUBAREA RUNOFF (CFS) = 29.68
 EFFECTIVE AREA(ACRES) = 102.82 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 163.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.49
 FLOW VELOCITY (FEET/SEC.) = 9.01 DEPTH*VELOCITY (FT*FT/SEC.) = 6.57
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.27
 PIPE-FLOW(CFS) = 44.85
 PIPEFLOW TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 20.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.399
 SUBAREA AREA(ACRES) = 18.79 SUBAREA RUNOFF(CFS) = 30.87
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 169.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 124.94
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.65
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20920.00 = 5528.08 FEET.
******************
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20920.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 8

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 20.21
 RAINFALL INTENSITY (INCH/HR) = 2.40
 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 102.82
 TOTAL STREAM AREA(ACRES) = 102.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 169.79
******************
 FLOW PROCESS FROM NODE 20910.00 TO NODE 20911.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 679.60
 ELEVATION DATA: UPSTREAM(FEET) = 1825.00 DOWNSTREAM(FEET) = 1795.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.443
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.566
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Ар
                                                 SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            0.59
                                    0.75
                                           0.600
                                                 56 10.44
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    в 4.98
                                    0.75
                                          0.900 56 12.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.868
 SUBAREA RUNOFF (CFS) = 14.62
 TOTAL AREA (ACRES) =
                    5.57 PEAK FLOW RATE (CFS) = 14.62
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20911.00 TO NODE 20912.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1795.00 DOWNSTREAM(FEET) = 1780.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 216.45 CHANNEL SLOPE = 0.0693
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 14.62
 FLOW VELOCITY (FEET/SEC.) = 3.13 FLOW DEPTH (FEET) = 0.43
 TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 11.59
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20912.00 = 896.05 FEET.
*****************
 FLOW PROCESS FROM NODE 20912.00 TO NODE 20912.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 11.59
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 9

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.349
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                   SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.20 0.75 0.600
                                                   56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 5.94 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890
 SUBAREA AREA (ACRES) = 6.14 SUBAREA RUNOFF (CFS) = 14.83
 EFFECTIVE AREA(ACRES) = 11.71 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 11.7
                              PEAK FLOW RATE (CFS) =
                                                    28.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20912.00 TO NODE 20913.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1780.00 DOWNSTREAM(FEET) = 1770.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 292.78 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              28.36
 FLOW VELOCITY (FEET/SEC.) = 2.85 FLOW DEPTH (FEET) = 0.63
 TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 13.30
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20913.00 = 1188.83 FEET.
*******************
 FLOW PROCESS FROM NODE 20913.00 TO NODE 20913.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.30
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.084
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                          Дp
   LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.69
                                     0.75
                                            0.600
                                                    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    B 9.60
                                     0.75
                                            0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA(ACRES) = 10.29 SUBAREA RUNOFF(CFS) = 22.46
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
                                                    48.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 10

```
FLOW PROCESS FROM NODE 20913.00 TO NODE 20914.00 IS CODE = 54
                                                                             MAINLINE Tc(MIN.) = 19.58
                                                                             * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.445
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fp
                                                                                                                         αA
                                                                                                                                SCS
______
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1740.00
                                                                             RESIDENTIAL
                                                                             ".4 DWELLING/ACRE" B 3.54 0.75
                                                                                                                          0.900
 CHANNEL LENGTH THRU SUBAREA (FEET) = 493.77 CHANNEL SLOPE = 0.0608
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" B 0.59 0.75
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                                                                          0.600
                                                                                                                                 56
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              48.03
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 3.40 FLOW DEPTH (FEET) = 0.53
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
 TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 15.72
                                                                                                         SUBAREA RUNOFF(CFS) = 6.71
                                                                             SUBAREA AREA(ACRES) = 4.13
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20914.00 = 1682.60 FEET.
                                                                             EFFECTIVE AREA(ACRES) = 34.98 AREA-AVERAGED Fm(INCH/HR) = 0.66
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
*******************
                                                                             TOTAL AREA (ACRES) =
                                                                                               35.0
                                                                                                           PEAK FLOW RATE(CFS) =
                                                                                                                                 59.18
 FLOW PROCESS FROM NODE 20914.00 TO NODE 20914.00 IS CODE = 81
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                             5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 MAINLINE Tc(MIN.) = 15.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.790
                                                                           **********************
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             FLOW PROCESS FROM NODE 20915.00 TO NODE 20916.00 IS CODE = 63
                                          Ap SCS
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                                                           ______
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                             >>>> (STREET TABLE SECTION # 5 USED) <<<<
 ".4 DWELLING/ACRE"
                    в 8.27
                                              0.900
                                      0.75
                                                    56
                                                                           ______
 RESIDENTIAL
                                                                             UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 "3-4 DWELLINGS/ACRE" B 0.58 0.75 0.600 56
                                                                             STREET LENGTH (FEET) = 683.96 CURB HEIGHT (INCHES) = 6.0
                                                                             STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA(ACRES) = 8.85 SUBAREA RUNOFF(CFS) = 16.98
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 EFFECTIVE AREA(ACRES) = 30.85 AREA-AVERAGED Fm(INCH/HR) = 0.66
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA(ACRES) = 30.9 PEAK FLOW RATE(CFS) =
                                                     59.18
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
****************
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
 FLOW PROCESS FROM NODE 20914.00 TO NODE 20915.00 IS CODE = 54
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 75.93
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                              ***STREET FLOWING FULL***
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
                                                                              STREET FLOW DEPTH (FEET) = 0.62
 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1720.00
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 23.99
 CHANNEL LENGTH THRU SUBAREA (FEET) = 642.16 CHANNEL SLOPE = 0.0311
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.20
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.84
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 21.42
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               59.18
                                                                             * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.317
 FLOW VELOCITY (FEET/SEC.) = 2.77 FLOW DEPTH (FEET) = 0.65
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 TRAVEL TIME (MIN.) = 3.86 Tc (MIN.) = 19.58
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fр
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20915.00 = 2324.76 FEET.
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
                                                                             RESIDENTIAL
******************
                                                                             "3-4 DWELLINGS/ACRE" B 1.86 0.75 0.600
                                                                                                                                 56
 FLOW PROCESS FROM NODE 20915.00 TO NODE 20915.00 IS CODE = 81
                                                                             RESIDENTIAL
                                                                             ".4 DWELLING/ACRE"
                                                                                                 B 20.51 0.75 0.900
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.875
```

Date: 04/21/2014

File name: LR0209ZZ.RES

Page 12

Date: 04/21/2014 File name: LR0209ZZ.RES Page 11

```
SUBAREA AREA (ACRES) = 22.37 SUBAREA RUNOFF (CFS) = 33.48
 EFFECTIVE AREA (ACRES) = 57.35 AREA-AVERAGED Fm (INCH/HR) = 0.66
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 TOTAL AREA (ACRES) = 57.3 PEAK FLOW RATE (CFS) = 85.77
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.09
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   FLOW VELOCITY (FEET/SEC.) = 8.27 DEPTH*VELOCITY (FT*FT/SEC.) = 5.30
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                         AND L = 576.8 FT WITH ELEVATION-DROP = 28.0 FT, IS 54.6 CFS,
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20917.00
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.09
 FLOW VELOCITY(FEET/SEC.) = 6.44 DEPTH*VELOCITY(FT*FT/SEC.) = 4.13
                                                                                   LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20917.00 = 3585.51 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                  **********************
       AND L = 684.0 FT WITH ELEVATION-DROP = 20.0 FT, IS 55.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20916.00
                                                                                   FLOW PROCESS FROM NODE 20917.00 TO NODE 20918.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20916.00 = 3008.72 FEET.
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                                   >>>> (STREET TABLE SECTION # 18 USED) <<<<
 FLOW PROCESS FROM NODE 20916.00 TO NODE 20917.00 IS CODE = 63
                                                                                  ______
                                                                                   UPSTREAM ELEVATION(FEET) = 1672.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
                                                                                   STREET LENGTH (FEET) = 727.03 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   STREET HALFWIDTH (FEET) = 26.00
_____
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1672.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET LENGTH (FEET) = 576.79 CURB HEIGHT (INCHES) = 6.0
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.60
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     STREET FLOW DEPTH(FEET) = 0.78
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 99.87
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 31.67
   ***STREET FLOWING FULL***
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.86
   STREET FLOW DEPTH (FEET) = 0.62
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.95 Tc (MIN.) = 24.56
   HALFSTREET FLOOD WIDTH (FEET) = 24.18
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.135
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.04
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.01
                                                                                                                        Fρ
                                                                                                                                           SCS
                                                                                       LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 22.61
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.243
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" B 12.63 0.75 0.600
                                                                                                                                           56
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                   RESIDENTIAL
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   ".4 DWELLING/ACRE" B 5.91 0.75 0.900 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.43 0.75 0.600 56
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 RESIDENTIAL
                                                                                   SUBAREA AREA (ACRES) = 18.54 SUBAREA RUNOFF (CFS) = 26.94
 ".4 DWELLING/ACRE" B 16.04 0.75 0.900 56
                                                                                   EFFECTIVE AREA(ACRES) = 95.36 AREA-AVERAGED Fm(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.84
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.847
                                                                                   TOTAL AREA (ACRES) = 95.4 PEAK FLOW RATE (CFS) = 129.58
 SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 28.20
 EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.65
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.87
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 TOTAL AREA (ACRES) = 76.8 PEAK FLOW RATE (CFS) = 110.13
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 13

File name: LR0209ZZ.RES Page 14

Date: 04/21/2014

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.16
 FLOW VELOCITY (FEET/SEC.) = 6.33 DEPTH*VELOCITY (FT*FT/SEC.) = 5.00
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20918.00 = 4312.54 FEET.
FLOW PROCESS FROM NODE 20918.00 TO NODE 20919.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 577.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.84
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.22
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.27
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 26.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.063
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                               αA
                                                      SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.91
                                       0.75
                                               0.600 56
 AGRICULTURAL FAIR COVER
                      в 0.10
                                     0.63 1.000 65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
 SUBAREA AREA (ACRES) = 10.01 SUBAREA RUNOFF (CFS) = 14.52
 EFFECTIVE AREA(ACRES) = 105.37 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 105.4 PEAK FLOW RATE (CFS) = 137.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.28
 FLOW VELOCITY (FEET/SEC.) = 6.69 DEPTH*VELOCITY (FT*FT/SEC.) = 5.30
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20919.00 = 4890.04 FEET.
*****************
```

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1600.00 STREET LENGTH (FEET) = 1346.52 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.82HALFSTREET FLOOD WIDTH (FEET) = 33.63 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.41 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 6.07 STREET FLOW TRAVEL TIME (MIN.) = 3.03 Tc (MIN.) = 29.03 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.931 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.53 0.75 0.600 56 AGRICULTURAL FAIR COVER "ORCHARDS" B 10.24 0.63 1.000 65 RESIDENTIAL ".4 DWELLING/ACRE" B 33.53 0.75 0.900 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.893 SUBAREA AREA(ACRES) = 48.30 SUBAREA RUNOFF(CFS) = 55.98 EFFECTIVE AREA(ACRES) = 153.67 AREA-AVERAGED Fm(INCH/HR) = 0.62 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.84TOTAL AREA (ACRES) = 153.7 PEAK FLOW RATE (CFS) = 181.39 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 34.66 FLOW VELOCITY (FEET/SEC.) = 7.62 DEPTH\*VELOCITY (FT\*FT/SEC.) = 6.40 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS. AND L = 1346.5 FT WITH ELEVATION-DROP = 40.0 FT, IS 97.5 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20920.00 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20920.00 = 6236.56 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20920.00 TO NODE 20920.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 16

FLOW PROCESS FROM NODE 20919.00 TO NODE 20920.00 IS CODE = 63

```
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 29.03
 RAINFALL INTENSITY (INCH/HR) = 1.93
 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.84
 EFFECTIVE STREAM AREA(ACRES) = 153.67
 TOTAL STREAM AREA(ACRES) = 153.67
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 181.39
 ** CONFLUENCE DATA **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae
                                                      HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          169.79 20.21 2.399 0.75(0.56) 0.75 102.8 20900.00
     2
          181.39 29.03 1.931 0.74(0.62) 0.84
                                               153.7 20910.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          341.19 20.21 2.399 0.74(0.59) 0.80 209.8 20900.00
          307.83 29.03 1.931 0.74(0.60) 0.80 256.5 20910.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 341.19 Tc (MIN.) = 20.21
 EFFECTIVE AREA(ACRES) = 209.81 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 256.5
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20920.00 = 6236.56 FEET.
******************
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20921.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1600.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1580.00
 FLOW LENGTH (FEET) = 766.09 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.08
 PIPE-FLOW(CFS) = 338.43
 PIPEFLOW TRAVEL TIME (MIN.) = 0.67 Tc (MIN.) = 20.88
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.353
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
                             0.05
                                              1.000
 "ORCHARDS"
                                        0.63
                                                       65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              11.48
                                        0.75
                                               0.600
```

```
RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 56.14 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 67.67 SUBAREA RUNOFF (CFS) = 112.16
 EFFECTIVE AREA(ACRES) = 277.48 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 324.2
                                PEAK FLOW RATE (CFS) = 444.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.94; 1HR = 1.24; 3HR = 2.02; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 106.16
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.53
 ** PEAK FLOW RATE TABLE **
  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                         HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
           444.59 20.88 2.353 0.74(0.57) 0.77 277.5 20900.00
           387.54 29.62 1.908 0.74(0.58) 0.78 324.2 20910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 444.59 Tc (MIN.) = 20.88
 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.77 EFFECTIVE AREA(ACRES) = 277.48
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20921.00 = 7002.65 FEET.
***********************
 FLOW PROCESS FROM NODE 20921.00 TO NODE 20922.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1580.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1560.00
 FLOW LENGTH (FEET) = 1453.35 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 50.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.07
 PIPE-FLOW(CFS) = 444.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 22.09
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 18

Date: 04/21/2014 File name: LR0209ZZ.RES Page 17

```
LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20922.00 = 8456.00 FEET.
                                                                                    LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                RESIDENTIAL
*******************
                                                                                "5-7 DWELLINGS/ACRE"
                                                                                                    В 6.04
                                                                                                                       0.75
                                                                                                                               0.500
 FLOW PROCESS FROM NODE 20922.00 TO NODE 20922.00 IS CODE = 81
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 30.00 0.75 0.600
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
                                                                                SUBAREA AREA(ACRES) = 36.04
 MAINLINE Tc(MIN.) = 22.09
                                                                                                             SUBAREA RUNOFF (CFS) = 57.63
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.275
                                                                                EFFECTIVE AREA(ACRES) = 391.81 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                                                                TOTAL AREA (ACRES) = 438.5 PEAK FLOW RATE (CFS) =
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "3-4 DWELLINGS/ACRE" B 10.56
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                        0.75
                                                0.600
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 31.42
                                        0.75
                                                0.700
                                                                                STREET CROSS-SECTION INFORMATION:
                                                      56
 RESIDENTIAL
                                                                                CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 "5-7 DWELLINGS/ACRE"
                    в 17.53
                                        0.75
                                               0.500
                                                      56
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 MOBILE HOME PARK
                      в 16.71
                                        0.75
                                                0.250
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 COMMERCIAL
                        В
                               2.07
                                        0.75
                                                0.100 56
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.530
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 SUBAREA AREA(ACRES) = 78.29
                               SUBAREA RUNOFF(CFS) = 132.35
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 EFFECTIVE AREA(ACRES) = 355.77 AREA-AVERAGED Fm(INCH/HR) = 0.61
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.83
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 TOTAL AREA(ACRES) = 402.4 PEAK FLOW RATE(CFS) = 531.46
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 77.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 ***STREET FLOWING FULL***
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH(FEET) = 0.58
 ** PEAK FLOW RATE TABLE **
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 22.16
  STREAM
           Q Tc Intensity Fp(Fm)
                                          Ар Ае
                                                      HEADWATER
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.34
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.28
    1
          555.80 22.18 2.269 0.74(0.53) 0.72 355.8 20900.00
          476.15 30.95 1.858 0.74(0.54)0.73 402.4 20910.00
                                                                                ** PEAK FLOW RATE TABLE **
 NEW PEAK FLOW DATA ARE:
                                                                                 STREAM Q To Intensity Fp(Fm) Ap Ae
 PEAK FLOW RATE (CFS) = 555.80 Tc (MIN.) = 22.18
                                                                                NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                                         595.32 23.13 2.213 0.74(0.52) 0.70 391.8 20900.00
                                                                                         510.59 31.79 1.829 0.74(0.53) 0.72
 AREA-AVERAGED Ap = 0.72 EFFECTIVE AREA(ACRES) = 355.77
                                                                                NEW PEAK FLOW DATA ARE:
*****************
                                                                                PEAK FLOW RATE (CFS) = 595.32 Tc (MIN.) = 23.13
 FLOW PROCESS FROM NODE 20922.00 TO NODE 20923.00 IS CODE = 33
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                                AREA-AVERAGED Ap = 0.70 EFFECTIVE AREA(ACRES) = 391.81
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20923.00 = 9961.73 FEET.
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                              ********************
______
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
                                                                                FLOW PROCESS FROM NODE 20923.00 TO NODE 20924.00 IS CODE = 48
 DOWNSTREAM NODE ELEVATION (FEET) = 1490.00
                                                                               ...........
 FLOW LENGTH (FEET) = 1505.73 MANNING'S N = 0.013
                                                                                >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                                >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
                                                                              ______
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1440.00
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 26.35
                                                                                FLOW LENGTH (FEET) = 1358.44 MANNING'S N = 0.014
                                                                                GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 PIPE-FLOW(CFS) = 517.82
 PIPEFLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 23.13
                                                                                *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 6.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.213
                                                                                ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 21.89
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                BOX-FLOW(CFS) = 595.32
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                                                                BOX-FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 24.16
       Date: 04/21/2014 File name: LR0209ZZ.RES
                                                      Page 19
                                                                                      Date: 04/21/2014
                                                                                                     File name: LR0209ZZ.RES
```

56

595.32

HEADWATER

438.5 20910.00

Page 20

```
LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20924.00 = 11320.17 FEET.
********************
 FLOW PROCESS FROM NODE 20924.00 TO NODE 20924.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 24.16
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.156
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                              Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   В
                             6.19
                                              0.500
                                      0.75
                                                     56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 35.81 0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.585
 SUBAREA AREA(ACRES) = 42.00 SUBAREA RUNOFF(CFS) = 64.93
 EFFECTIVE AREA(ACRES) = 433.81 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 480.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*************
 FLOW PROCESS FROM NODE 20924.00 TO NODE 20939.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 1153.84 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 8.19
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 19.53
 BOX-FLOW(CFS) = 640.04
 BOX-FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 25.15
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 25.15
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.105
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                     Fρ
                                            αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                            2.86
                                      0.75
                                              0.500
                                                   56
                                      0.75
                             0.48
                                              0.600
                                                   56
 SCHOOL
                       В
 RESIDENTIAL
                             11.63
 "3-4 DWELLINGS/ACRE"
                       В
                                      0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.581
```

```
SUBAREA AREA(ACRES) = 14.97
                             SUBAREA RUNOFF (CFS) = 22.50
 EFFECTIVE AREA(ACRES) = 448.78 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 495.5
                               PEAK FLOW RATE(CFS) =
                                                    642.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.15
 RAINFALL INTENSITY (INCH/HR) = 2.10
 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 448.78
 TOTAL STREAM AREA(ACRES) = 495.46
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  642.61
******************
 FLOW PROCESS FROM NODE 20930.00 TO NODE 20931.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 975.69
 ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.455
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.063
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
                                              Aρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            8.68
                                   0.75
                                             0.600
                                                     56 13.46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 20.42
 TOTAL AREA (ACRES) = 8.68 PEAK FLOW RATE (CFS) =
                                                20.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20931.00 TO NODE 20932.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 500.18 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

Page 22

Date: 04/21/2014

Date: 04/21/2014 File name: LR0209ZZ.RES Page 21

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.87
 STREET FLOW TRAVEL TIME (MIN.) = 1.96 Tc (MIN.) = 15.42
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.822
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.59 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 1.59 SUBAREA RUNOFF (CFS) = 3.40
 EFFECTIVE AREA(ACRES) = 10.27 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 10.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.77
 FLOW VELOCITY (FEET/SEC.) = 4.21 DEPTH*VELOCITY (FT*FT/SEC.) = 1.86
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20932.00 = 1475.87 FEET.
*********************
 FLOW PROCESS FROM NODE 20932.00 TO NODE 20933.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1560.00
 STREET LENGTH (FEET) = 1367.05 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.76
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   54.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.39
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.07
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.33
 STREET FLOW TRAVEL TIME (MIN.) = 3.75 Tc (MIN.) = 19.17
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.477
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.11 0.75 0.600
                     B 22.59 0.75 0.600 56
 SCHOOL
 PUBLIC PARK
                      В
                              1.47 0.75 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.610
 SUBAREA AREA(ACRES) = 36.17
                              SUBAREA RUNOFF (CFS) = 65.77
 EFFECTIVE AREA(ACRES) = 46.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 46.4 PEAK FLOW RATE (CFS) =
                                                        84.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.93
 FLOW VELOCITY (FEET/SEC.) = 6.93 DEPTH*VELOCITY (FT*FT/SEC.) = 4.29
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1367.1 FT WITH ELEVATION-DROP = 50.0 FT, IS 81.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20933.00
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20933.00 = 2842.92 FEET.
******************
 FLOW PROCESS FROM NODE 20933.00 TO NODE 20934.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1510.00
 FLOW LENGTH (FEET) = 1450.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 19.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.93
 PIPE-FLOW(CFS) =
                   84.51
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 20.45
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20934.00 = 4292.92 FEET.
******************
 FLOW PROCESS FROM NODE 20934.00 TO NODE 20934.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 23 Date: 04/21/2014 File name: LR0209ZZ.RES Page 24

```
MAINLINE Tc(MIN.) = 20.45
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.383
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              Аp
                                                     SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                              26.74
                                               0.600
 "3-4 DWELLINGS/ACRE"
                                       0.75
                                                      56
 PUBLIC PARK
                       R
                              9.16
                                       0.75
                                               0.850
 SCHOOL
                       В
                              6.76
                                       0.75
                                               0.600
                                                      56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               6.64
                                       0.63
                                               1.000
                                                      65
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 2.77
                                    0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 52.07 SUBAREA RUNOFF (CFS) = 87.82
 EFFECTIVE AREA(ACRES) = 98.51 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) = 168.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****
 FLOW PROCESS FROM NODE 20934.00 TO NODE 20935.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1510.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1485.00
 FLOW LENGTH (FEET) = 871.47 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 27.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 21.00
 PIPE-FLOW(CFS) = 168.40
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 21.14
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20935.00 = 5164.39 FEET.
******************
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20935.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.14
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.336
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                                      Fρ
                                               αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              67.33
                                       0.75
                                               0.600
                                                     56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                       В
                              8.70
                                       0.63
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
 SUBAREA AREA(ACRES) = 76.03
                              SUBAREA RUNOFF (CFS) = 127.69
```

```
EFFECTIVE AREA(ACRES) = 174.54 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.65
 TOTAL AREA(ACRES) = 174.5
                             PEAK FLOW RATE(CFS) =
                                                  291.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20936.00 IS CODE = 48
_____
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1485.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 799.10 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 3.00 GIVEN BOX HEIGHT (FEET) = 6.00
 *GIVEN BOX HEIGHT(FEET) = 6.00 ESTIMATED BOX BASEWIDTH(FEET) = 3.10
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.71
 BOX-FLOW(CFS) = 291.92
 BOX-FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 21.99
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20936.00 = 5963.49 FEET.
FLOW PROCESS FROM NODE 20936.00 TO NODE 20936.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 21.99
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.281
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           101.89
                                     0.75
                                           0.600
                                                   56
 COMMERCIAL
                    В
                           1.19
                                    0.75
                                           0.100
                                                  56
 MOBILE HOME PARK
                      В
                         18.61
                                    0.75
                                           0.250
                                                   56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 2.78
                                    0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.541
 SUBAREA AREA(ACRES) = 124.47 SUBAREA RUNOFF(CFS) = 210.24
 EFFECTIVE AREA(ACRES) = 299.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 299.0
                             PEAK FLOW RATE(CFS) =
                                                  493.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20936.00 TO NODE 20937.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1440.00
 FLOW LENGTH (FEET) = 712.54 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 5.97
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 25 Date: 04/21/2014 File name: LR0209ZZ.RES

Page 26

```
ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 20.67
 BOX-FLOW(CFS) = 493.61
 BOX-FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 22.56
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20937.00 = 6676.03 FEET.
FLOW PROCESS FROM NODE 20937.00 TO NODE 20937.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 22.56
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.246
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                           Αp
                                                 SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                            6.69
                                    0.75
                                           0.600
                                                56
 MOBILE HOME PARK
                            28.27
                                    0.75
                                           0.250
                                                 56
                    В
 COMMERCIAL
                    В
                            1.13
                                    0.75
                                           0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.310
 SUBAREA AREA(ACRES) = 36.09
                           SUBAREA RUNOFF (CFS) = 65.42
 EFFECTIVE AREA(ACRES) = 335.10 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 335.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20937.00 TO NODE 20938.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1415.00
 FLOW LENGTH (FEET) = 983.49 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 7.40
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 18.57
 BOX-FLOW(CFS) = 549.60
 BOX-FLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 23.44
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20938.00 = 7659.52 FEET.
*****
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20938.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 23.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.195
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Αp
                                                 SCS
                                   Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                     В
                            3.30
                                    0.75
                                           0.100
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     в 20.77
                                    0.75
                                           0.600
                                                 56
 RESIDENTIAL
```

```
"5-7 DWELLINGS/ACRE"
                           10.89
                       В
                                       0.75
                                               0.500
                                                      56
                       В
                            29.98
                                       0.75 0.250
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.396
 SUBAREA AREA(ACRES) = 64.94
                              SUBAREA RUNOFF (CFS) = 110.97
 EFFECTIVE AREA(ACRES) = 400.04 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) =
                     400.0
                                PEAK FLOW RATE (CFS) =
                                                      645.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20939.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 668.85 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 13.09
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 12.32
 BOX-FLOW(CFS) = 645.14
 BOX-FLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 24.35
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20939.00 = 8328.37 FEET.
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 24.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.146
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                               6.87
                                       0.75
                                               0.500
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       B 0.91
                                       0.75
                                               0.600
                                                      56
 SCHOOL
                       В
                               3.23
                                       0.75
                                               0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.538
 SUBAREA AREA(ACRES) = 11.01
                              SUBAREA RUNOFF (CFS) = 17.28
 EFFECTIVE AREA(ACRES) = 411.05 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
 TOTAL AREA(ACRES) = 411.1
                                PEAK FLOW RATE(CFS) =
                                                     645.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 28

(UPSTREAM NODE PEAK FLOW RATE(CFS) = 1283.44) \_\_\_\_\_\_ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 24.35RAINFALL INTENSITY (INCH/HR) = 2.15AREA-AVERAGED Fm(INCH/HR) = 0.40AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54EFFECTIVE STREAM AREA(ACRES) = 411.05 TOTAL STREAM AREA(ACRES) = 411.05 PEAK FLOW RATE (CFS) AT CONFLUENCE = 645.14 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE BOX-FLOW(CFS) = 1283.44642.61 25.15 2.105 0.75(0.51) 0.69 448.8 20900.00 1 551.51 33.87 1.760 0.74(0.52) 0.70 1 495.5 20910.00 645.14 24.35 2.146 0.74(0.40) 0.54 411.1 20930.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM 0 MAINLINE Tc (MIN.) = 36.46NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 1283.44 24.35 2.146 0.74(0.46) 0.62 845.6 20930.00 859.8 20900.00 1272.53 25.15 2.105 0.74(0.46) 0.62 DEVELOPMENT TYPE/ 3 1053.98 33.87 1.760 0.74(0.47) 0.63 906.5 20910.00 LAND USE SCHOOL В COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: RESIDENTIAL PEAK FLOW RATE (CFS) = 1283.44 Tc (MIN.) = 24.35 "3-4 DWELLINGS/ACRE" EFFECTIVE AREA(ACRES) = 845.59 AREA-AVERAGED Fm(INCH/HR) = 0.46 MOBILE HOME PARK AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.62 COMMERCIAL В TOTAL AREA(ACRES) = 906.5 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET. SUBAREA AREA(ACRES) = 94.33 UNIT-HYDROGRAPH DATA: FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 71 \_\_\_\_\_\_ >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD< >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH< \_\_\_\_\_\_ UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.03;6H= 2.75;24H= 5.50 S-GRAPH: VALLEY (DEV.) = 81.6%; VALLEY (UNDEV.) / DESERT= 18.4% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Page 29

Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.47; Ybar = 0.49 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 906.5 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0413; Lca/L=0.4,n=.0370; Lca/L=0.5,n=.0340; Lca/L=0.6,n=.0317 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 226.82 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 1110.97 TOTAL PEAK FLOW RATE (CFS) = 1110.97 (SOURCE FLOW INCLUDED) RATIONAL METHOD PEAK FLOW RATE (CFS) = 1283.44

File name: LR020977.RFS

Date: 04/21/2014

PEAK FLOW RATE (CFS) USED = 1283.44 FLOW PROCESS FROM NODE 20939.00 TO NODE 20940.00 IS CODE = 48 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>> \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1409.00 DOWNSTREAM(FEET) = 1370.00 FLOW LENGTH (FEET) = 2606.42 MANNING'S N = 0.014GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00 \*GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 19.16 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.74 BOX-FLOW TRAVEL TIME (MIN.) = 2.59 Tc (MIN.) = 36.46LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET. FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.684 SUBAREA LOSS RATE DATA (AMC II): SCS SOIL AREA Fp Αp SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN 57.18 0.75 0.600 56 B 27.41 0.75 0.600 56 В 4.75 0.75 0.250 56 4.99 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556 RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.03;6H= 2.75;24H= 5.50 S-GRAPH: VALLEY(DEV.) = 83.3%; VALLEY(UNDEV.) / DESERT= 16.7% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.46; Ybar = 0.49 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1000.8 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0378; Lca/L=0.4,n=.0339; Lca/L=0.5,n=.0311; Lca/L=0.6,n=.0290 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 252.25 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1151.75 TOTAL AREA(ACRES) = 1000.8 PEAK FLOW RATE (CFS) = 1283.44NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 10

Date: 04/21/2014 File name: LR020977.RFS Page 30

```
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20852.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2498.67 Tc (MIN.) = 38.48
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.52
 TOTAL AREA (ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2498.67 Tc (MIN.) = 38.48
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.52
 TOTAL AREA (ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
*******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<<
_____
*************************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20940.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1413.00 DOWNSTREAM(FEET) = 1370.00
 FLOW LENGTH (FEET) = 2071.80 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 12.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 6.41 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 32.51
 BOX-FLOW(CFS) = 2498.67
 BOX-FLOW TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 39.54
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 2498.67
                         Tc(MIN.) = 39.54
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.52
 TOTAL AREA(ACRES) = 2992.9
```

```
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1283.44 Tc (MIN.) = 36.46
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.49
 TOTAL AREA (ACRES) = 1000.8
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.11;3H= 1.86;6H= 2.57;24H= 5.38
 S-GRAPH: VALLEY (DEV.) = 90.1%; VALLEY (UNDEV.) / DESERT = 9.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.48; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 3993.8
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221; Lca/L=0.6,n=.0206
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 915.14
 PEAK FLOW RATE (CFS) = 3254.49
*******************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
______
******************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20955.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1360.00
 FLOW LENGTH (FEET) = 618.86 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 16.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 6.45 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 31.53
 BOX-FLOW(CFS) = 3254.49
 BOX-FLOW TRAVEL TIME (MIN.) = 0.33 Tc (MIN.) = 39.87
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
**********************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 3254.49 Tc (MIN.) = 39.87
 AREA-AVERAGED Fm (INCH/HR) = 0.48 Ybar = 0.51
 TOTAL AREA (ACRES) =
                   3993.8
*****************
 FLOW PROCESS FROM NODE 20950.00 TO NODE 20951.00 IS CODE = 21
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 31 Date: 04/21/2014 File name: LR0209ZZ.RES Page 32

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 667.18
 ELEVATION DATA: UPSTREAM(FEET) = 1438.00 DOWNSTREAM(FEET) = 1417.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.046
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.887
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Ap SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 MOBILE HOME PARK
                    В
                               4.45
                                        0.75
                                                0.250
                                                       56
                                                           9.05
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.19
                                        0.75
                                                0.600
                                                      56 11.09
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
 SUBAREA RUNOFF (CFS) =
                     18.50
 TOTAL AREA (ACRES) = 5.64 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
******************
 FLOW PROCESS FROM NODE 20951.00 TO NODE 20952.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 1417.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 191.07
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.768
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                       SCS
                                                αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                               0.46
                                        0.75
                                                0.600
 MOBILE HOME PARK
                      В
                              2.56
                                        0.75
                                                0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.303
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.31
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.61
 AVERAGE FLOW DEPTH (FEET) = 0.55 FLOOD WIDTH (FEET) = 26.08
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.48 Tc(MIN.) = 9.53
 SUBAREA AREA(ACRES) = 3.02
                               SUBAREA RUNOFF(CFS) = 9.62
 EFFECTIVE AREA(ACRES) = 8.66 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 8.7 PEAK FLOW RATE (CFS) =
                                                         27.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.57 FLOOD WIDTH(FEET) = 28.47
```

```
LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20952.00 = 858.25 FEET.
FLOW PROCESS FROM NODE 20952.00 TO NODE 20953.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 1409.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1404.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 204.94
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.625
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                             1.20
                                       0.75
                                               0.600
                                                       56
 MOBILE HOME PARK
                      В
                              1.83 0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.389
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.07
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.40
 AVERAGE FLOW DEPTH (FEET) = 0.62 FLOOD WIDTH (FEET) = 35.34
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 10.16
 SUBAREA AREA(ACRES) = 3.03 SUBAREA RUNOFF(CFS) = 9.09
 EFFECTIVE AREA(ACRES) = 11.69 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 11.7
                               PEAK FLOW RATE(CFS) =
                                                        35.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.64 FLOOD WIDTH(FEET) = 36.98
 FLOW VELOCITY (FEET/SEC.) = 5.51 DEPTH*VELOCITY (FT*FT/SEC) = 3.52
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20953.00 = 1063.19 FEET.
******************
 FLOW PROCESS FROM NODE 20953.00 TO NODE 20954.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1404.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1400.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 260.93
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.438
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                    Fp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
       Date: 04/21/2014
```

Page 34

FLOW VELOCITY (FEET/SEC.) = 6.74 DEPTH\*VELOCITY (FT\*FT/SEC) = 3.82

```
"3-4 DWELLINGS/ACRE"
                             3.52
                                       0.75 0.600
                       В
                                                      56
                       В
                               0.19
                                        0.75
                                              0.250 56
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                            40.51
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.63
 AVERAGE FLOW DEPTH(FEET) = 0.70 FLOOD WIDTH(FEET) = 43.70
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 11.10
 SUBAREA AREA(ACRES) = 3.71
                               SUBAREA RUNOFF (CFS) = 10.02
 EFFECTIVE AREA(ACRES) = 15.40 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA (ACRES) = 15.4 PEAK FLOW RATE (CFS) =
                                                         43.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.71 FLOOD WIDTH (FEET) = 45.04
 FLOW VELOCITY (FEET/SEC.) = 4.70 DEPTH*VELOCITY (FT*FT/SEC) = 3.33
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20954.00 = 1324.12 FEET.
********************
 FLOW PROCESS FROM NODE 20954.00 TO NODE 20955.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1400.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1360.00
 FLOW LENGTH (FEET) = 1961.31 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 84.0 INCH PIPE IS 12.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 12.19
 PIPE-FLOW(CFS) = 43.55
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.68 Tc (MIN.) = 13.78
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20955.00 = 3285.43 FEET.
********************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.78
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.019
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                                                Ар
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                      B
                               0.07
                                        0.75
                                               0.850 56
 RESIDENTIAL
                               7.87
                                               0.600 56
 "3-4 DWELLINGS/ACRE"
                    В
                                        0.75
 MOBILE HOME PARK
                               1.54
                                        0.75
                                               0.250
                                               0.100
                        В
                               9.50
                                        0.75
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.322
 SUBAREA AREA (ACRES) = 18.98 SUBAREA RUNOFF (CFS) = 47.45
 EFFECTIVE AREA(ACRES) = 34.38 AREA-AVERAGED Fm(INCH/HR) = 0.27
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.35
                    34.4
                                                      85.20
 TOTAL AREA (ACRES) =
                                PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.78
 RAINFALL INTENSITY (INCH/HR) = 3.02
 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 34.38
 TOTAL STREAM AREA(ACRES) = 34.38
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 85.20
 ** CONFLUENCE DATA **
 STREAM
         Ω
                 Tc
                        AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                   NODE
         3254.49 39.87 3993.76 20620.00
   1
         85.20 13.78 34.38 20950.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.12;3H= 1.86;6H= 2.57;24H= 5.38
 S-GRAPH: VALLEY(DEV.) = 90.2%; VALLEY(UNDEV.) / DESERT = 9.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.48; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4028.1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0265; Lca/L=0.4, n=.0238; Lca/L=0.5, n=.0218; Lca/L=0.6, n=.0204
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 925.48
 PEAK FLOW RATE (CFS) = 3269.51
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20539.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4219.05 Tc (MIN.) = 46.82
```

Page 36

Date: 04/21/2014

Date: 04/21/2014 File name: LR0209ZZ.RES Page 35

```
AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA(ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
************************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4219.05 Tc (MIN.) = 46.82
 AREA-AVERAGED Fm (INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
FLOW PROCESS FROM NODE 20539.00 TO NODE 20955.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1366.00 DOWNSTREAM(FEET) = 1360.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 385.80 CHANNEL SLOPE = 0.0156
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 4219.05
 FLOW VELOCITY (FEET/SEC.) = 29.51 FLOW DEPTH (FEET) = 5.97
 TRAVEL TIME (MIN.) = 0.22 Tc (MIN.) = 47.03
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 4219.05 Tc (MIN.) = 47.03
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.53
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 3269.51 Tc (MIN.) = 39.87
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.51
 TOTAL AREA (ACRES) = 4028.1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.15
```

```
S-GRAPH: VALLEY(DEV.) = 68.9%; VALLEY(UNDEV.) / DESERT = 31.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.78; LAG(HR) = 0.63; Fm(INCH/HR) = 0.52; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10026.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0280; Lca/L=0.4, n=.0251; Lca/L=0.5, n=.0231; Lca/L=0.6, n=.0215
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2507.28
 PEAK FLOW RATE (CFS) = 6046.33
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<<
______
*****************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20956.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1360.00 DOWNSTREAM(FEET) = 1350.00
 FLOW LENGTH (FEET) = 666.58 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 7.41 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 35.47
 BOX-FLOW(CFS) = 6046.33
 BOX-FLOW TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 47.35
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
*******************
 FLOW PROCESS FROM NODE 20956.00 TO NODE 20956.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 47.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.440
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          αp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                            5.80
 "3-4 DWELLINGS/ACRE"
                    В
                                     0.75
                                            0.600
                                                    56
                            17.13
                                                    56
 COMMERCIAL
                      В
                                     0.75
                                            0.100
 PUBLIC PARK
                             0.39
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.237
 SUBAREA AREA(ACRES) = 23.32
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.15
 S-GRAPH: VALLEY(DEV.) = 69.0%; VALLEY(UNDEV.) / DESERT = 31.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.79; LAG(HR) = 0.63; Fm(INCH/HR) = 0.52; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
```

Page 38

Date: 04/21/2014

Date: 04/21/2014 File name: LR020977.RFS Page 37

```
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10049.7
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0278; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0229; Lca/L=0.6,n=.0213
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2515.68
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 6040.39
 TOTAL AREA (ACRES) = 10049.7
                              PEAK FLOW RATE (CFS) = 6046.33
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20956.00 TO NODE 20968.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1335.00
 FLOW LENGTH (FEET) = 926.11 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 23.00 GIVEN BOX HEIGHT(FEET) = 10.00
 FLOWDEPTH IN BOX IS 7.21 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 36.45
 BOX-FLOW(CFS) = 6046.33
 BOX-FLOW TRAVEL TIME (MIN.) = 0.42 Tc (MIN.) = 47.77
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 47.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.432
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                              Aр
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                               2.51
                                         0.75
                                                0.600 56
                        В
                                3.07
                                         0.75
                                                0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325
 SUBAREA AREA(ACRES) = 5.58
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.15
 S-GRAPH: VALLEY (DEV.) = 69.0%; VALLEY (UNDEV.) / DESERT= 31.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.80; LAG(HR) = 0.64; Fm(INCH/HR) = 0.52; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10055.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0274; Lca/L=0.4,n=.0245; Lca/L=0.5,n=.0226; Lca/L=0.6,n=.0210
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2517.52
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6006.90
 TOTAL AREA (ACRES) = 10055.3
                              PEAK FLOW RATE(CFS) = 6046.33
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 6046.33 Tc (MIN.) = 47.77
 AREA-AVERAGED Fm (INCH/HR) = 0.52 Ybar = 0.52
 TOTAL AREA(ACRES) = 10055.3
**********************
 FLOW PROCESS FROM NODE 20960.00 TO NODE 20961.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 935.10
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1360.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.634
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                   SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 3.18
                                     0.75
                                            0.500
                                                    56 12.95
                      В
 COMMERCIAL
                             4.70
                                     0.75
                                            0.100
                                                    56 10.12
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           0.91
                                     0.75
                                            0.600
                                                    56 13.72
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.296
 SUBAREA RUNOFF (CFS) = 26.99
 TOTAL AREA (ACRES) = 8.79 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 20961.00 TO NODE 20962.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1360.00 DOWNSTREAM ELEVATION(FEET) = 1359.00
 STREET LENGTH (FEET) = 280.72 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

File name: LR0209ZZ.RES

Page 40

Date: 04/21/2014

Date: 04/21/2014 File name: LR0209ZZ.RES Page 39

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                     ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.84
                                                                                    STREET FLOW DEPTH (FEET) = 0.74
   ***STREET FLOWING FULL***
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 29.85
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.18
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
   STREET FLOW DEPTH(FEET) = 0.66
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 13.60
   HALFSTREET FLOOD WIDTH (FEET) = 26.01
                                                                                   * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.043
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.52
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 12.15
                                                                                   DEVELOPMENT TYPE/
                                                                                                     SCS SOIL AREA
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.256
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       LAND USE
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   RESIDENTIAL
                                                                                   "5-7 DWELLINGS/ACRE" B 1.24 0.75
COMMERCIAL B 1.91 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                αA
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                   RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     B 1.51
                                         0.75
                                                 0.500 56
                                                                                   "3-4 DWELLINGS/ACRE" B 0.56 0.75 0.600
                       в 2.33
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 COMMERCIAL
                                         0.75
                                                 0.100 56
 RESIDENTIAL
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.309
 "3-4 DWELLINGS/ACRE" B 0.44 0.75 0.600 56
                                                                                   SUBAREA AREA (ACRES) = 3.71 SUBAREA RUNOFF (CFS) = 9.39
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   EFFECTIVE AREA(ACRES) = 16.78 AREA-AVERAGED Fm(INCH/HR) = 0.22
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.293
                                                                                   AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 SUBAREA AREA (ACRES) = 4.28 SUBAREA RUNOFF (CFS) = 11.70
                                                                                   TOTAL AREA (ACRES) = 16.8 PEAK FLOW RATE (CFS) =
 EFFECTIVE AREA(ACRES) = 13.07 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA(ACRES) = 13.1 PEAK FLOW RATE(CFS) =
                                                          35.70
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.46
                                                                                   FLOW VELOCITY (FEET/SEC.) = 2.21 DEPTH*VELOCITY (FT*FT/SEC.) = 1.65
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
 DEPTH (FEET) = 0.68 HALFSTREET FLOOD WIDTH (FEET) = 26.86
                                                                                         AND L = 189.1 FT WITH ELEVATION-DROP = 0.5 FT, IS 13.1 CFS,
 FLOW VELOCITY (FEET/SEC.) = 2.35 DEPTH*VELOCITY (FT*FT/SEC.) = 1.59
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20963.00
                                                                                   LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20963.00 = 1404.92 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 280.7 FT WITH ELEVATION-DROP = 1.0 FT, IS 14.2 CFS,
                                                                                 ******************
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20962.00
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20962.00 = 1215.82 FEET.
                                                                                   FLOW PROCESS FROM NODE 20963.00 TO NODE 20964.00 IS CODE = 63
                                                                                 ______
*****************
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20962.00 TO NODE 20963.00 IS CODE = 63
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 _____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   UPSTREAM ELEVATION(FEET) = 1358.50 DOWNSTREAM ELEVATION(FEET) = 1358.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
_____
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 1359.00 DOWNSTREAM ELEVATION(FEET) = 1358.50
 STREET LENGTH (FEET) = 189.10 CURB HEIGHT (INCHES) = 6.0
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 42

40.40

0.500

0.100

46.87

56

56

42.59

```
***STREET FLOWING FULL***
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 33.51
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.26
   STREET FLOW DEPTH(FEET) = 0.78
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.83
   HALFSTREET FLOOD WIDTH (FEET) = 32.05
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 16.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.20
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.699
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.72
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 15.12
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                       LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.855
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   RESIDENTIAL
                                                                                   "5-7 DWELLINGS/ACRE" A 0.14
                                                                                                                           0.98
                                                                                                                                   0.500
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                   RESIDENTIAL
                                                                                   "5-7 DWELLINGS/ACRE" B 1.29
                                                                                                                                   0.500
 RESIDENTIAL
                                                                                                                           0.75
 "5-7 DWELLINGS/ACRE" B 1.22
                                         0.75
                                                 0.500
                                                                                   RESIDENTIAL
                      В 1.94
                                         0.75
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                        B 0.85
                                                                                                                           0.75
 COMMERCIAL
                                                 0.100 56
                                                                                                                                   0.600
 RESIDENTIAL
                                                                                   COMMERCIAL
                                                                                                          В
                                                                                                                  1.55
                                                                                                                           0.75 0.100
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.360
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.298
                                                                                   SUBAREA AREA (ACRES) = 3.83 SUBAREA RUNOFF (CFS) = 8.36
 SUBAREA AREA(ACRES) = 3.61 SUBAREA RUNOFF(CFS) = 8.55
                                                                                   EFFECTIVE AREA(ACRES) = 24.22 AREA-AVERAGED Fm(INCH/HR) = 0.23
 EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.31
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
                                                                                   TOTAL AREA (ACRES) = 24.2 PEAK FLOW RATE (CFS) =
 TOTAL AREA (ACRES) = 20.4 PEAK FLOW RATE (CFS) = 48.30
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 33.82
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.42
                                                                                   FLOW VELOCITY (FEET/SEC.) = 2.28 DEPTH*VELOCITY (FT*FT/SEC.) = 1.86
 FLOW VELOCITY (FEET/SEC.) = 2.22 DEPTH*VELOCITY (FT*FT/SEC.) = 1.75
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                         AND L = 201.6 FT WITH ELEVATION-DROP = 0.5 FT, IS 13.0 CFS,
       AND L = 201.6 FT WITH ELEVATION-DROP = 0.5 FT, IS 12.5 CFS,
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20965.00
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20964.00
                                                                                   LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20965.00 = 1808.10 FEET.
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20964.00 = 1606.51 FEET.
                                                                                 ******************
******************
                                                                                   FLOW PROCESS FROM NODE 20965.00 TO NODE 20966.00 IS CODE = 63
 FLOW PROCESS FROM NODE 20964.00 TO NODE 20965.00 IS CODE = 63
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 _____
                                                                                   UPSTREAM ELEVATION(FEET) = 1357.50 DOWNSTREAM ELEVATION(FEET) = 1357.00
 UPSTREAM ELEVATION(FEET) = 1358.00 DOWNSTREAM ELEVATION(FEET) = 1357.50
                                                                                   STREET LENGTH (FEET) = 207.50 CURB HEIGHT (INCHES) = 6.0
 STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                      58.43
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     ***STREET FLOWING FULL***
   ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.84
   STREET FLOW DEPTH (FEET) = 0.81
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 35.16
```

Page 43

Date: 04/21/2014

File name: LR020977.RFS

Date: 04/21/2014 File name: LR0209ZZ.RES Page 44

SCS

32

56

56

53.80

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.29
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.389
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.94
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 18.12
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.562
                                                                                  LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                RESIDENTIAL
                                                                                "5-7 DWELLINGS/ACRE" A 2.02 0.98 0.500
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                      32
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                RESIDENTIAL
                                                                                "5-7 DWELLINGS/ACRE" B 0.32
                                                                                                                      0.75 0.500
 RESIDENTIAL
                                                                                COMMERCIAL
 "5-7 DWELLINGS/ACRE" A 0.74
                                                                                                    A 0.04
                                                                                                                      0.98 0.100
                                        0.98
                                                0.500
                                                                                                              4.03
                                                                                                                      0.75 0.100 56
 RESIDENTIAL
                                                                                COMMERCIAL
                                                                                                     В
 "5-7 DWELLINGS/ACRE"
                    В 0.93
                                              0.500 56
                                       0.75
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
                               2.70
                                             0.100 56
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
 COMMERCIAL
                      B
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
                                                                                SUBAREA AREA (ACRES) = 6.41 SUBAREA RUNOFF (CFS) = 12.52
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.253
                                                                                EFFECTIVE AREA(ACRES) = 35.00 AREA-AVERAGED Fm(INCH/HR) = 0.23
 SUBAREA AREA(ACRES) = 4.37
                              SUBAREA RUNOFF(CFS) = 9.26
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.29
 EFFECTIVE AREA(ACRES) = 28.59 AREA-AVERAGED Fm(INCH/HR) = 0.23
                                                                                TOTAL AREA (ACRES) = 35.0 PEAK FLOW RATE (CFS) = 68.14
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.30
 TOTAL AREA (ACRES) = 28.6 PEAK FLOW RATE (CFS) =
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.96
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                FLOW VELOCITY (FEET/SEC.) = 2.56 DEPTH*VELOCITY (FT*FT/SEC.) = 2.20
 DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 35.53
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 FLOW VELOCITY (FEET/SEC.) = 2.31 DEPTH*VELOCITY (FT*FT/SEC.) = 1.97
                                                                                   AND L = 341.5 FT WITH ELEVATION-DROP = 1.0 FT, IS 19.8 CFS,
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                     WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20967.00
       AND L = 207.5 FT WITH ELEVATION-DROP = 0.5 FT, IS 15.0 CFS,
                                                                                LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20967.00 = 2357.15 FEET.
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20966.00
                                                                              *******************
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20966.00 = 2015.60 FEET.
                                                                                FLOW PROCESS FROM NODE 20967.00 TO NODE 20968.00 IS CODE = 33
*****************
                                                                              ______
 FLOW PROCESS FROM NODE 20966.00 TO NODE 20967.00 IS CODE = 63
                                                                               >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
______
                                                                               >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              ______
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1356.00
_____
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1335.00
 UPSTREAM ELEVATION(FEET) = 1357.00 DOWNSTREAM ELEVATION(FEET) = 1356.00
                                                                                FLOW LENGTH (FEET) = 1730.15 MANNING'S N = 0.013
 STREET LENGTH (FEET) = 341.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
                                                                                DEPTH OF FLOW IN 42.0 INCH PIPE IS 23.8 INCHES
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 12.11
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                PIPE-FLOW(CFS) =
                                                                                                68.14
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 22.89
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.227
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                                            13.57 0.75 0.100
                                                                                COMMERCIAL
                                                                                RESIDENTIAL
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 66.33
                                                                                "3-4 DWELLINGS/ACRE" B 3.04 0.75 0.600
   ***STREET FLOWING FULL***
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192
   STREET FLOW DEPTH(FEET) = 0.85
                                                                                SUBAREA AREA (ACRES) = 16.61 SUBAREA RUNOFF (CFS) = 31.15
                                                                                EFFECTIVE AREA(ACRES) = 51.61 AREA-AVERAGED Fm(INCH/HR) = 0.20
   HALFSTREET FLOOD WIDTH (FEET) = 35.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.54
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.17
                                                                                TOTAL AREA (ACRES) = 51.6 PEAK FLOW RATE (CFS) = 94.17
 STREET FLOW TRAVEL TIME (MIN.) = 2.24 Tc (MIN.) = 20.35
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 45 Date: 04/21/2014 File name: LR0209ZZ.RES Page 46

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                             STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 26.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 19.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20968.00 = 4087.30 FEET.
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 22.89
 RAINFALL INTENSITY (INCH/HR) = 2.23
 AREA-AVERAGED Fm(INCH/HR) = 0.20
 AREA-AVERAGED Fp(INCH/HR) = 0.77
 AREA-AVERAGED Ap = 0.26
 EFFECTIVE STREAM AREA(ACRES) = 51.61
 TOTAL STREAM AREA (ACRES) = 51.61
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 94.17
 ** CONFLUENCE DATA **
 STREAM O TC AREA
                                   HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
   1
         6046.33 47.77 10055.32 20120.00
          94.17 22.89 51.61 20960.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.15
 S-GRAPH: VALLEY(DEV.) = 69.1%; VALLEY(UNDEV.) / DESERT = 30.9%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.80; LAG(HR) = 0.64; Fm(INCH/HR) = 0.52; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0274; Lca/L=0.4,n=.0245; Lca/L=0.5,n=.0226; Lca/L=0.6,n=.0210
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2535.56
```

File name: LR0209ZZ.RES

Page 47

Date: 04/21/2014

```
PEAK FLOW RATE(CFS) = 6043.30
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 6046.33)
 PEAK FLOW RATE (CFS) USED = 6046.33
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
PEAK FLOWRATE TABLE FILE NAME: 20968.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES)
           = 10106.9 TC(MIN.) = 47.77
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.52
 PEAK FLOW RATE (CFS) = 6046.33
______
```

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0209ZZ.RES Page 48

Date: 04/21/2014 File name: LR0209ZZ.RES Page 49 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21070

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 210/0

FILE NAME: LR0210ZZ.DAT

TIME/DATE OF STUDY: 08:10 11/19/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	HALF -	CROWN 10	SIKEEI-CKOSSIKLL.	COND	GOIIEK-GEOMEIKIES.			DNITNIMI
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

```
17 20.0
           10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180
18 26.0
            15.0
                   0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0
            20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
   WATERSHED LAG = 0.80 * Tc
   USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF
   1 UNITS/ACRE AND LESS: AND "VALLEY DEVELOPED" S-GRAPH
   FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE.
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
******************
 FLOW PROCESS FROM NODE 21000.00 TO NODE 21001.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 690.87
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1518.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.815
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.314
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
                              5.92 0.75 0.600
 "3-4 DWELLINGS/ACRE" B
                                                        56 11.82
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 15.27
 TOTAL AREA(ACRES) = 5.92 PEAK FLOW RATE(CFS) =
                                                 15 27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 21001.00 TO NODE 21002.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1480.00
 STREET LENGTH (FEET) = 646.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
       Date: 04/21/2014
                        File name: LR0210ZZ.RES
                                                       Page 2
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 1

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                LAND USE
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                             RESIDENTIAL
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             SCHOOT.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 14.76
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.38
 STREET FLOW TRAVEL TIME (MIN.) = 1.90 Tc (MIN.) = 13.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.030
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            9.22
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.22
                             SUBAREA RUNOFF (CFS) = 21.42
 EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                       35.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.63
 FLOW VELOCITY(FEET/SEC.) = 6.10 DEPTH*VELOCITY(FT*FT/SEC.) = 2.80
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21002.00 = 1337.47 FEET.
FLOW PROCESS FROM NODE 21002.00 TO NODE 21013.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1433.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1375.46 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 35.17
                                                                                 LAND USE
 FLOW VELOCITY (FEET/SEC.) = 6.26 FLOW DEPTH (FEET) = 1.09
                                                                             RESIDENTIAL
 TRAVEL TIME (MIN.) = 3.66 Tc (MIN.) = 17.38
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.
*****************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 17.38
```

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.629
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" B 7.03 0.75 0.600
                                                   56
                           7.98 0.75 0.600 56
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 15.01 SUBAREA RUNOFF (CFS) = 29.45
 EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 30.2
                              PEAK FLOW RATE(CFS) =
                                                   59.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
**********************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.38
 RAINFALL INTENSITY (INCH/HR) = 2.63
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 30.15
 TOTAL STREAM AREA(ACRES) = 30.15
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                 59.15
*******************
 FLOW PROCESS FROM NODE 21010.00 TO NODE 21011.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.60
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1462.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.628
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.184
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           Дp
                                                  SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 "3-4 DWELLINGS/ACRE"
                    B 7.05 0.75 0.600
                                                 56 12.63
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 17.36
 TOTAL AREA (ACRES) = 7.05 PEAK FLOW RATE (CFS) = 17.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 3 Date: 04/21/2014 File name: LR0210ZZ.RES Page 4

```
******************
 FLOW PROCESS FROM NODE 21011.00 TO NODE 21012.00 IS CODE = 63
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1462.00 DOWNSTREAM ELEVATION(FEET) = 1440.00
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 809.73 CURB HEIGHT (INCHES) = 6.0
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                              28.76
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ***STREET FLOWING FULL***
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET FLOW DEPTH (FEET) = 0.50
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 18.00
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.08
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.02
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 17.19
                                                                               * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.647
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.08
                                                                               SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fp
   STREET FLOW DEPTH(FEET) = 0.45
                                                                                   LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   HALFSTREET FLOOD WIDTH (FEET) = 16.40
                                                                               RESIDENTIAL
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.11
                                                                               "3-4 DWELLINGS/ACRE" B 0.66 0.75 0.600 56
                                                                                                   B 1.95 0.75 0.600 56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.87
                                                                               SCHOOL
 STREET FLOW TRAVEL TIME (MIN.) = 3.28 Tc (MIN.) = 15.91
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.772
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                               SUBAREA AREA (ACRES) = 2.61 SUBAREA RUNOFF (CFS) = 5.16
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.45
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                              aα
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 RESIDENTIAL
                                                                               TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                                                                                                      29.93
 "3-4 DWELLINGS/ACRE"
                    В
                               4.37
                                       0.75
                                             0.600 56
 SCHOOL
                      В
                             1.10
                                     0.75 0.600 56
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.47 SUBAREA RUNOFF (CFS) = 11.44
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 12.52 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                               DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.01
                                                                               FLOW VELOCITY (FEET/SEC.) = 4.14 DEPTH*VELOCITY (FT*FT/SEC.) = 2.07
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) =
                                                        26.18
                                                                               LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21013.00 = 2033.40 FEET.
                                                                              ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                               FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.26
                                                                               >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 FLOW VELOCITY (FEET/SEC.) = 4.23 DEPTH*VELOCITY (FT*FT/SEC.) = 1.99
                                                                              _____
 LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21012.00 = 1721.33 FEET.
                                                                               TOTAL NUMBER OF STREAMS = 2
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
*****************
                                                                               TIME OF CONCENTRATION (MIN.) = 17.19
 FLOW PROCESS FROM NODE 21012.00 TO NODE 21013.00 IS CODE = 63
                                                                               RAINFALL INTENSITY (INCH/HR) = 2.65
-----
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.45
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               AREA-AVERAGED Ap = 0.60
_____
                                                                               EFFECTIVE STREAM AREA(ACRES) = 15.13
 UPSTREAM ELEVATION(FEET) = 1440.00 DOWNSTREAM ELEVATION(FEET) = 1433.00
                                                                               TOTAL STREAM AREA(ACRES) = 15.13
 STREET LENGTH (FEET) = 312.07 CURB HEIGHT (INCHES) = 6.0
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                                                 29.93
 STREET HALFWIDTH (FEET) = 18.00
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 5 Date: 04/21/2014 File name: LR0210ZZ.RES Page 6

** CONFLUENCE DATA **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 59.15 17.38 2.629 0.75 (0.45) 0.60 30.2 21000.00  2 29.93 17.19 2.647 0.75 (0.45) 0.60 15.1 21010.00  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  CONFLUENCE FORMULA USED FOR 2 STREAMS.	"3-4 DWELLINGS/ACRE" B 19.47 0.75 0.600 56  COMMERCIAL B 2.09 0.75 0.100 56  MOBILE HOME PARK B 0.23 0.75 0.250 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548  SUBAREA AREA (ACRES) = 21.79 SUBAREA RUNOFF(CFS) = 38.95  EFFECTIVE AREA (ACRES) = 66.73 AREA-AVERAGED Fm(INCH/HR) = 0.44  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58  TOTAL AREA (ACRES) = 67.1 PEAK FLOW RATE(CFS) = 117.70
** PEAK FLOW RATE TABLE **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 88.89 17.19 2.647 0.75 (0.45) 0.60 44.9 21010.00  2 88.84 17.38 2.629 0.75 (0.45) 0.60 45.3 21000.00  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE (CFS) = 88.89 Tc(MIN.) = 17.19  EFFECTIVE AREA (ACRES) = 44.94 AREA-AVERAGED Fm(INCH/HR) = 0.45	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50  **********************************
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60  TOTAL AREA(ACRES) = 45.3  LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.  **********************************	UPSTREAM ELEVATION (FEET) = 1380.00 DOWNSTREAM ELEVATION (FEET) = 1345.00  STREET LENGTH (FEET) = 1339.49 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>>	INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
ELEVATION DATA: UPSTREAM(FEET) = 1433.00 DOWNSTREAM(FEET) = 1380.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 1311.64 CHANNEL SLOPE = 0.0404 CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH(FEET) = 2.50 CHANNEL FLOW THRU SUBAREA(CFS) = 88.89 FLOW VELOCITY(FEET/SEC.) = 7.05 FLOW DEPTH(FEET) = 1.16	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.41
TRAVEL TIME (MIN.) = 3.10 Tc (MIN.) = 20.28  LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21014.00 = 4024.57 FEET.  ** PEAK FLOW RATE TABLE **	***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.74
STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 88.89 20.28 2.396 0.75 (0.45) 0.60 44.9 21010.00  2 88.84 20.48 2.382 0.75 (0.45) 0.60 45.3 21000.00  NEW PEAK FLOW DATA ARE:	HALFSTREET FLOOD WIDTH(FEET) = 30.10  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.87  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.09  STREET FLOW TRAVEL TIME(MIN.) = 3.25 Tc(MIN.) = 23.54  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.192  SUBAREA LOSS RATE DATA(AMC II):
PEAK FLOW RATE(CFS) = 88.89 Tc(MIN.) = 20.28  AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.75  AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA(ACRES) = 44.94	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.31 0.75 0.600 56
**************************************	MOBILE HOME PARK B 9.23 0.75 0.250 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.361  SUBAREA AREA(ACRES) = 13.54 SUBAREA RUNOFF(CFS) = 23.41  EFFECTIVE AREA(ACRES) = 80.27 AREA-AVERAGED FM(INCH/HR) = 0.41
MAINLINE Tc(MIN.) = 20.28  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.396 SUBAREA LOSS RATE DATA(AMC II):	AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.55  TOTAL AREA(ACRES) = 80.6 PEAK FLOW RATE(CFS) = 128.84
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

Date: 04/21/2014 File name: LR0210ZZ.RES Page 7

File name: LR0210ZZ.RES

Page 8

Date: 04/21/2014

```
END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                              FLOW VELOCITY (FEET/SEC.) = 5.41 DEPTH*VELOCITY (FT*FT/SEC.) = 4.49
 DEPTH (FEET) = 0.74 HALFSTREET FLOOD WIDTH (FEET) = 30.04
                                                                              *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 FLOW VELOCITY (FEET/SEC.) = 6.86 DEPTH*VELOCITY (FT*FT/SEC.) = 5.08
                                                                                    AND L = 945.3 FT WITH ELEVATION-DROP = 13.0 FT, IS 26.6 CFS,
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                    WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21032.00
       AND L = 1339.5 FT WITH ELEVATION-DROP = 35.0 FT, IS 35.9 CFS,
                                                                              LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21015.00
                                                                             **********************
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21015.00 = 5364.06 FEET.
                                                                              FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1
********************
                                                                             ______
 FLOW PROCESS FROM NODE 21015.00 TO NODE 21032.00 IS CODE = 63
                                                                              >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>
                                                                             ______
                                                                              TOTAL NUMBER OF STREAMS = 2
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              TIME OF CONCENTRATION (MIN.) = 26.42
______
 UPSTREAM ELEVATION(FEET) = 1345.00 DOWNSTREAM ELEVATION(FEET) = 1332.00
                                                                              RAINFALL INTENSITY (INCH/HR) = 2.04
 STREET LENGTH (FEET) = 945.30 CURB HEIGHT (INCHES) = 6.0
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.40
 STREET HALFWIDTH (FEET) = 18.00
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                              AREA-AVERAGED Ap = 0.54
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              EFFECTIVE STREAM AREA(ACRES) = 89.83
                                                                              TOTAL STREAM AREA(ACRES) = 90.17
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 132.79
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                             *******************
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              FLOW PROCESS FROM NODE 21020.00 TO NODE 21021.00 IS CODE = 21
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                              >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                             INITIAL SUBAREA FLOW-LENGTH (FEET) = 732.03
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.12
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1442.00 DOWNSTREAM(FEET) = 1440.00
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.84
                                                                              Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   HALFSTREET FLOOD WIDTH (FEET) = 34.80
                                                                              SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.306
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.46
                                                                              * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.837
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.56
                                                                              SUBAREA TC AND LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 26.42
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fp
                                                                                                                            αA
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.045
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                  LAND USE
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE" B
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                         1.89
                                                                                                                    0.75
                                                                                                                            0.600
                                               αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              MOBILE HOME PARK
                                                                                                  B 4.31 0.75 0.250 56 15.31
     LAND USE
 RESIDENTIAL
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" B
                             1.76
                                       0.75
                                               0.600 56
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.357
                              3.85
                                               0.600
                                                     56
 SCHOOL
                     В
                                       0.75
                                                                              SUBAREA RUNOFF (CFS) = 14.34
 MOBILE HOME PARK
                      В
                              2.60
                                       0.75
                                               0.250 56
                                                                              TOTAL AREA (ACRES) = 6.20 PEAK FLOW RATE (CFS) = 14.34
                                               0.850 56
 PUBLIC PARK
                       В
                              0.44
                                       0.75
                              0.91
                                               0.100
 COMMERCIAL
                       В
                                       0.75
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.469
                                                                             SUBAREA AREA(ACRES) = 9.56
                             SUBAREA RUNOFF (CFS) = 14.57
 EFFECTIVE AREA(ACRES) = 89.83 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                              FLOW PROCESS FROM NODE 21021.00 TO NODE 21022.00 IS CODE = 63
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 90.2 PEAK FLOW RATE (CFS) = 132.79
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             ______
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                              UPSTREAM ELEVATION (FEET) = 1440.00 DOWNSTREAM ELEVATION (FEET) = 1433.00
                                                                              STREET LENGTH (FEET) = 186.35 CURB HEIGHT (INCHES) = 6.0
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                              STREET HALFWIDTH (FEET) = 18.00
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 34.49
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 9 Date: 04/21/2014 File name: LR021077.RFS Page 10

56 18.77

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.03
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.42
  HALFSTREET FLOOD WIDTH (FEET) = 14.52
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.50
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.87
 STREET FLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 16.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.763
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                      B 4.18 0.75 0.250 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.81 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.307
 SUBAREA AREA(ACRES) = 4.99 SUBAREA RUNOFF(CFS) = 11.38
 EFFECTIVE AREA(ACRES) = 11.19 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 TOTAL AREA (ACRES) = 11.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.93
 FLOW VELOCITY (FEET/SEC.) = 4.76 DEPTH*VELOCITY (FT*FT/SEC.) = 2.12
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21022.00 = 918.38 FEET.
********************
 FLOW PROCESS FROM NODE 21022.00 TO NODE 21023.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1433.00 DOWNSTREAM ELEVATION(FEET) = 1416.00
 STREET LENGTH (FEET) = 274.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.66
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   34.02
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.24
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.17
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.78
 STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 16.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.689
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK B 6.51 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.37 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.311
 SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 17.42
 EFFECTIVE AREA(ACRES) = 19.07 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 19.1 PEAK FLOW RATE (CFS) = 41.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.65
 FLOW VELOCITY (FEET/SEC.) = 6.49 DEPTH*VELOCITY (FT*FT/SEC.) = 3.11
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21023.00 = 1192.68 FEET.
******************
 FLOW PROCESS FROM NODE 21023.00 TO NODE 21024.00 IS CODE = 63
_______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1416.00 DOWNSTREAM ELEVATION(FEET) = 1402.00
 STREET LENGTH (FEET) = 250.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.43
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 18.26
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.68
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.37
 STREET FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 17.36
```

File name: LR0210ZZ.RES

Page 12

Date: 04/21/2014

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.631
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.447
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AREA (ACRES) = 7.40 SUBAREA RUNOFF (CFS) = 14.66
                                                                                EFFECTIVE AREA(ACRES) = 33.29 AREA-AVERAGED Fm(INCH/HR) = 0.26
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK B 6.35 0.75 0.250 56
                                                                                TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.47 0.75 0.600 56
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.274
 SUBAREA AREA (ACRES) = 6.82 SUBAREA RUNOFF (CFS) = 14.89
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 25.89 AREA-AVERAGED Fm(INCH/HR) = 0.23
                                                                                DEPTH (FEET) = 0.60 HALFSTREET FLOOD WIDTH (FEET) = 22.83
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.31
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.12 DEPTH*VELOCITY (FT*FT/SEC.) = 3.65
 TOTAL AREA(ACRES) = 25.9 PEAK FLOW RATE(CFS) =
                                                                                LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21025.00 = 1833.70 FEET.
                                                                              ****************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46: 30M = 0.95: 1HR = 1.25: 3HR = 2.03: 6HR = 2.75: 24HR = 5.50
                                                                                FLOW PROCESS FROM NODE 21025.00 TO NODE 21026.00 IS CODE = 63
                                                                              ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 19.05
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 6.99 DEPTH*VELOCITY (FT*FT/SEC.) = 3.64
                                                                              LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21024.00 = 1443.07 FEET.
                                                                                UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1385.00
                                                                                STREET LENGTH (FEET) = 357.04 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21024.00 TO NODE 21025.00 IS CODE = 63
_____
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1402.00 DOWNSTREAM ELEVATION(FEET) = 1390.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 390.63 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.61
                                                                                 ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 STREET FLOW DEPTH (FEET) = 0.68
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 26.98
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.68
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                                                 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.18
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.27 Tc(MIN.) = 19.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  63.20
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.437
   ***STREET FLOWING FULL***
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                                                   Fp
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.58
                                                                                    LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 22.16
                                                                                RESIDENTIAL
                                                                                                   B 1.32 0.75 0.600
                                                                                "3-4 DWELLINGS/ACRE"
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.99
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.49
                                                                                                     В
                                                                                                              1.20
                                                                                                                             0.100
                                                                                COMMERCIAL
                                                                                                                       0.75
 STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 18.45
                                                                                MOBILE HOME PARK
                                                                                                     B
                                                                                                              0.81
                                                                                                                       0.75 0.250
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.536
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.335
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                       SCS
                                                                                SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) = 6.55
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                EFFECTIVE AREA (ACRES) = 36.62 AREA-AVERAGED Fm (INCH/HR) = 0.26
     LAND USE
 RESIDENTIAL
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 "3-4 DWELLINGS/ACRE" B
                             4.17
                                      0.75
                                             0.600
                                                                                TOTAL AREA (ACRES) = 36.6 PEAK FLOW RATE (CFS) =
 MOBILE HOME PARK B 3.23
                                        0.75
                                                0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014

File name: LR0210ZZ.RES

68.34

SCS

56

Page 14

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.05
 FLOW VELOCITY (FEET/SEC.) = 4.68 DEPTH*VELOCITY (FT*FT/SEC.) = 3.19
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21026.00 = 2190.74 FEET.
******************
 FLOW PROCESS FROM NODE 21026.00 TO NODE 21027.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1385.00 DOWNSTREAM ELEVATION(FEET) = 1374.00
 STREET LENGTH (FEET) = 355.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               77.55
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.94
 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 20.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.370
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              αA
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 2.67
                                        0.75 0.600 56
                             3.22
                                       0.75 0.100 56
 COMMERCIAL
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.327
 SUBAREA AREA (ACRES) = 5.89 SUBAREA RUNOFF (CFS) = 11.27
 EFFECTIVE AREA(ACRES) = 42.51 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 42.5 PEAK FLOW RATE (CFS) =
                                                        80.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 24.30
 FLOW VELOCITY(FEET/SEC.) = 6.46 DEPTH*VELOCITY(FT*FT/SEC.) = 4.04
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21027.00 = 2546.13 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1374.00 DOWNSTREAM ELEVATION(FEET) = 1368.00
 STREET LENGTH (FEET) = 309.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  85.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.17
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.78
 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 21.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.308
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.72
                                       0.75
                                               0.600
 COMMERCIAL
                      В
                             2.05 0.75 0.100
                                                      56
 MOBILE HOME PARK
                     В
                               0.45 0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
 SUBAREA AREA (ACRES) = 5.22 SUBAREA RUNOFF (CFS) = 9.53
 EFFECTIVE AREA(ACRES) = 47.73 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 47.7 PEAK FLOW RATE(CFS) = 88.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.47
 FLOW VELOCITY (FEET/SEC.) = 5.57 DEPTH*VELOCITY (FT*FT/SEC.) = 3.84
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21028.00 = 2855.86 FEET.
******************
 FLOW PROCESS FROM NODE 21028.00 TO NODE 21029.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1368.00 DOWNSTREAM ELEVATION(FEET) = 1363.00
 STREET LENGTH (FEET) = 301.01 CURB HEIGHT (INCHES) = 6.0
```

FLOW PROCESS FROM NODE 21027.00 TO NODE 21028.00 IS CODE = 63

Date: 04/21/2014 File name: LR0210ZZ.RES Page 15

File name: LR0210ZZ.RES

Page 16

Date: 04/21/2014

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 128.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.70
  HALFSTREET FLOOD WIDTH (FEET) = 28.14
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.73
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.44
 STREET FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 23.30
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.205
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    B 9.68 0.75 0.100
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 27.42 0.75 0.600
 MOBILE HOME PARK B 2.60
                                      0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455
 SUBAREA AREA(ACRES) = 39.70 SUBAREA RUNOFF(CFS) = 66.61
 EFFECTIVE AREA(ACRES) = 92.56 AREA-AVERAGED Fm(INCH/HR) = 0.29
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA (ACRES) = 92.6 PEAK FLOW RATE (CFS) = 159.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.65
 FLOW VELOCITY (FEET/SEC.) = 8.16 DEPTH*VELOCITY (FT*FT/SEC.) = 6.15
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 360.4 FT WITH ELEVATION-DROP = 13.0 FT, IS 161.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21030.00
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21030.00 = 3517.22 FEET.
********************
 FLOW PROCESS FROM NODE 21030.00 TO NODE 21031.00 IS CODE = 48
_____
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1340.00
 FLOW LENGTH (FEET) = 474.31 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 2.50
 FLOWDEPTH IN BOX IS 1.65 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.07
 BOX-FLOW(CFS) = 159.34
 BOX-FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 23.79
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21031.00 = 3991.53 FEET.
******************
 FLOW PROCESS FROM NODE 21031.00 TO NODE 21031.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 18

Date: 04/21/2014 File name: LR0210ZZ.RES Page 17

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
MAINLINE Tc(MIN.) = 23.79
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.177
                                                                          ** CONFLUENCE DATA **
 SUBAREA LOSS RATE DATA(AMC II):
                                                                           STREAM
                                                                                   0
                                                                                         Tc Intensity Fp(Fm) Ap Ae
                                                                                                                           HEADWATER
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                        Ар
                                                  SCS
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES) NODE
                                                                                  132.79 26.42 2.045 0.75(0.40) 0.54 89.8 21010.00
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           1
     LAND USE
 RESIDENTIAL
                                                                            1
                                                                                  132.53 26.62 2.035 0.75(0.40) 0.54 90.2 21000.00
                             2.14
 "3-4 DWELLINGS/ACRE"
                   В
                                     0.75
                                            0.600
                                                                                  170.64 23.79 2.177 0.75(0.29) 0.39 100.6 21020.00
                             3.35
                                            0.100 56
 COMMERCIAL
                     В
                                     0.75
                      В
 SCHOOL
                             0.63
                                     0.75
                                            0.600 56
                                                                          RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          CONFLUENCE FORMULA USED FOR 2 STREAMS.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
                                                                          ** PEAK FLOW RATE TABLE **
 SUBAREA AREA(ACRES) = 6.12
                            SUBAREA RUNOFF (CFS) = 10.65
 EFFECTIVE AREA(ACRES) = 98.68 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                                  Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES) NODE
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA (ACRES) =
                  98.7 PEAK FLOW RATE(CFS) = 167.70
                                                                           1
                                                                                   299.88 23.79 2.177 0.75(0.34) 0.46
                                                                                                                    181.5 21020.00
                                                                                   291.41 26.42 2.045 0.75(0.34) 0.46 190.4 21010.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            3
                                                                                   290.32 26.62
                                                                                               2.035 0.75(0.34) 0.46 190.7 21000.00
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.59
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
********************
                                                                          PEAK FLOW RATE (CFS) = 299.88 Tc (MIN.) = 23.79
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 81
                                                                          EFFECTIVE AREA(ACRES) = 181.46 AREA-AVERAGED Fm(INCH/HR) = 0.34
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          TOTAL AREA(ACRES) = 190.7
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
______
 MAINLINE Tc(MIN.) = 23.79
                                                                        ******************
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.177
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          FLOW PROCESS FROM NODE 21032.00 TO NODE 21043.00 IS CODE = 48
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                        ______
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA
 RESIDENTIAL
                                                                          >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 "3-4 DWELLINGS/ACRE"
                                                                        _____
                                   0.75 0.600 56
                           0.62
                    В
                           1.27
                                  0.75 0.600 56
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1327.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          FLOW LENGTH (FEET) = 353.61 MANNING'S N = 0.014
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                          GIVEN BOX BASEWIDTH (FEET) = 11.00 GIVEN BOX HEIGHT (FEET) = 2.50
 SUBAREA AREA(ACRES) = 1.89
                            SUBAREA RUNOFF(CFS) = 2.94
                                                                          FLOWDEPTH IN BOX IS 1.77 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 15.36
 EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                          BOX-FLOW(CFS) = 299.88
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
                                                                          BOX-FLOW TRAVEL TIME (MIN.) = 0.38 Tc (MIN.) = 24.18
 TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 170.64
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.
                                                                        *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.47
                                                                          FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
*********************
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1
                                                                        _____
______
                                                                          MAINLINE Tc (MIN.) = 24.18
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.157
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
_____
                                                                                                             Fρ
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TOTAL NUMBER OF STREAMS = 2
                                                                             LAND USE
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          RESIDENTIAL
 TIME OF CONCENTRATION (MIN.) = 23.79
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                            В
                                                                                                    2.84
                                                                                                              0.75
                                                                                                                     0.600
                                                                                                                            56
                                                                                                      2.77
                                                                                                                     0.600
                                                                                                                            56
 RAINFALL INTENSITY (INCH/HR) = 2.18
                                                                          SCHOOL
                                                                                               В
                                                                                                              0.75
 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                          COMMERCIAL
                                                                                                    2.00
                                                                                                              0.75
                                                                                                                     0.100
                                                                                                                            56
                                                                          MOBILE HOME PARK
                                                                                             В
                                                                                                      6.89
                                                                                                              0.75
                                                                                                                     0.250
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.39
                                                                          PUBLIC PARK
                                                                                                      1.56
                                                                                                              0.75
 EFFECTIVE STREAM AREA(ACRES) = 100.57
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL STREAM AREA(ACRES) = 100.57
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 170.64
                                                                          SUBAREA AREA(ACRES) = 16.06
                                                                                                     SUBAREA RUNOFF (CFS) = 26.72
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 19 Date: 04/21/2014 File name: LR0210ZZ.RES Page 20

```
EFFECTIVE AREA(ACRES) = 197.52 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 323.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          323.39 24.16 2.158 0.75(0.34) 0.45 197.5 21020.00
    1
          313.54 26.77 2.029 0.75(0.34) 0.46
                                              206.5 21010.00
    2
    3
          312.50 26.95 2.020 0.75(0.34) 0.46
                                              206.8 21000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 323.39 Tc (MIN.) = 24.16
 AREA-AVERAGED Fm (INCH/HR) = 0.34 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45 EFFECTIVE AREA(ACRES) = 197.52
********************
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.16
 RAINFALL INTENSITY (INCH/HR) = 2.16
 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45
 EFFECTIVE STREAM AREA(ACRES) = 197.52
 TOTAL STREAM AREA(ACRES) = 206.80
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 323.39
******************
 FLOW PROCESS FROM NODE 21040.00 TO NODE 21041.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 905.71
 ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1350.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.925
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.296
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                               Ар
                                                     SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                            7.08
 COMMERCIAL
                     B
                                    0.75
                                              0.100 56 11.92
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.20
                                                    56 16.16
                                      0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
 SUBAREA RUNOFF(CFS) = 31.28
 TOTAL AREA (ACRES) = 11.28 PEAK FLOW RATE (CFS) = 31.28
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

File name: LR0210ZZ.RES

Page 21

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 21041.00 TO NODE 21042.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1350.00 DOWNSTREAM ELEVATION(FEET) = 1341.00
 STREET LENGTH (FEET) = 642.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  44.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.59
  HALFSTREET FLOOD WIDTH (FEET) = 22.47
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.08
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.41
 STREET FLOW TRAVEL TIME (MIN.) = 2.62 Tc (MIN.) = 14.55
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.925
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                               αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                               4.00
                                        0.75
                                               0.600
                                                       56
                      В
                             5.39
                                       0.75 0.100
                                                       56
 COMMERCIAL
 SCHOOL
                               1.37
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA (ACRES) = 10.76 SUBAREA RUNOFF (CFS) = 25.79
 EFFECTIVE AREA (ACRES) = 22.04 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.12
 FLOW VELOCITY (FEET/SEC.) = 4.31 DEPTH*VELOCITY (FT*FT/SEC.) = 2.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 642.5 FT WITH ELEVATION-DROP = 9.0 FT, IS 34.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21042.00
 LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21042.00 = 1548.21 FEET.
FLOW PROCESS FROM NODE 21042.00 TO NODE 21043.00 IS CODE = 48
```

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

```
312.50 26.95 2.020 0.75(0.34) 0.46
                                                                                                                      206.8 21000.00
                                                                                   61.83 15.96 2.767 0.75(0.28) 0.37
                                                                                                                      27.6 21040.00
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 ELEVATION DATA: UPSTREAM(FEET) = 1341.00 DOWNSTREAM(FEET) = 1327.00
                                                                          CONFLUENCE FORMULA USED FOR 2 STREAMS.
 FLOW LENGTH (FEET) = 896.68 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 5.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                          ** PEAK FLOW RATE TABLE **
 FLOWDEPTH IN BOX IS 1.00 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 10.62
                                                                          STREAM
                                                                                   0
                                                                                         Tc Intensity Fp(Fm)
                                                                                                                    Ae
                                                                                                                           HEADWATER
                                                                          NUMBER
 BOX-FLOW(CFS) = 53.31
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES) NODE
                                                                                  347.00 15.96 2.767 0.75 (0.33) 0.44 158.1 21040.00
 BOX-FLOW TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 15.96
                                                                           1
 LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21043.00 = 2444.89 FEET.
                                                                                  370.07 24.16 2.158 0.75(0.33) 0.44
                                                                                                                      225.1 21020.00
                                                                            3
                                                                                  357.01 26.77 2.029 0.75(0.33) 0.45
                                                                                                                      234.1 21010.00
*****
                                                                                  355.77 26.95 2.020 0.75(0.33) 0.45
                                                                                                                      234.4 21000.00
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                          PEAK FLOW RATE (CFS) = 370.07 Tc (MIN.) = 24.16
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          EFFECTIVE AREA(ACRES) = 225.12 AREA-AVERAGED Fm(INCH/HR) = 0.33
_____
 MAINLINE Tc(MIN.) = 15.96
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.767
                                                                          TOTAL AREA (ACRES) = 234.4
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                          Аp
                                                  SCS
                                                                        ******************
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                    В
                             0.11
                                     0.75
                                            0.100 56
                                                                          FLOW PROCESS FROM NODE 21043.00 TO NODE 21044.00 IS CODE = 48
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.51
                                  0.75
                                          0.600
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                           2.94
 SCHOOL
                    В
                                     0.75
                                            0.600 56
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1318.00
 SUBAREA AREA(ACRES) = 5.56 SUBAREA RUNOFF(CFS) = 11.64
                                                                         FLOW LENGTH (FEET) = 665.51 MANNING'S N = 0.014
 EFFECTIVE AREA(ACRES) = 27.60 AREA-AVERAGED Fm(INCH/HR) = 0.28
                                                                          GIVEN BOX BASEWIDTH (FEET) = 12.00 GIVEN BOX HEIGHT (FEET) = 2.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37
                                                                         *GIVEN BOX HEIGHT (FEET) = 2.50 ESTIMATED BOX BASEWIDTH (FEET) = 12.64
 TOTAL AREA (ACRES) = 27.6
                            PEAK FLOW RATE(CFS) =
                                                   61.83
                                                                          ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 11.71
                                                                          BOX-FLOW(CFS) = 370.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          BOX-FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 25.10
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET.
*******************
                                                                        ********************
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1
                                                                          FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 81
______
                                                                        ______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                        _____
                                                                          MAINLINE Tc(MIN.) = 25.10
______
 TOTAL NUMBER OF STREAMS = 2
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.108
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 TIME OF CONCENTRATION (MIN.) = 15.96
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fр
                                                                                                                   Ap
                                                                                                                           SCS
 RAINFALL INTENSITY (INCH/HR) = 2.77
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Fm(INCH/HR) = 0.28
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                            В
                                                                                                             0.75 0.600
                                                                                                                            56
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                                                    4.70
 AREA-AVERAGED Ap = 0.37
                                                                          COMMERCIAL
                                                                                              В
                                                                                                    13.39
                                                                                                             0.75
                                                                                                                    0.100
 EFFECTIVE STREAM AREA(ACRES) = 27.60
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL STREAM AREA(ACRES) = 27.60
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.230
                                                                                                    SUBAREA RUNOFF(CFS) = 31.53
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 61.83
                                                                          SUBAREA AREA(ACRES) = 18.09
                                                                          EFFECTIVE AREA(ACRES) = 243.21 AREA-AVERAGED Fm(INCH/HR) = 0.32
 ** CONFLUENCE DATA **
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          TOTAL AREA (ACRES) = 252.5 PEAK FLOW RATE (CFS) =
                                                                                                                         391.62
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                      (ACRES) NODE
   1
         323.39 24.16 2.158 0.75(0.34) 0.45 197.5 21020.00
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
         313.54 26.77 2.029 0.75(0.34) 0.46
                                            206.5 21010.00
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 23

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 24

```
** PEAK FLOW RATE TABLE **
             Tc Intensity Fp(Fm) Ap Ae HEADWATER
 STREAM
       0
 NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                   176.1 21040.00
   1
        377.91 16.67 2.696 0.75(0.31) 0.42
                                    243.2 21020.00
   2
        394.82 24.82 2.123 0.75 (0.32) 0.43
        380.83 27.41 2.000 0.75(0.32) 0.43
                                     252.1 21010.00
        379.83 27.55 1.994 0.75 (0.32) 0.43
                                     252.5 21000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 394.82 Tc (MIN.) = 24.82
 AREA-AVERAGED Fm(INCH/HR) = 0.32 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.43 EFFECTIVE AREA(ACRES) = 243.21
******************
 FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
*******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20968.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 6046.33 Tc (MIN.) = 47.77
 AREA-AVERAGED Fm (INCH/HR) = 0.52 Ybar = 0.52
 TOTAL AREA(ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
*****
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 6046.33 Tc (MIN.) = 47.77
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.52
 TOTAL AREA (ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
*****************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 21044.00 IS CODE = 48
.....
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1335.00 DOWNSTREAM(FEET) = 1318.00
 FLOW LENGTH (FEET) = 1136.29 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
```

```
BOX-FLOW(CFS) = 6046.33
 BOX-FLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 48.31
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 11
_____
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 6046.33 Tc (MIN.) = 48.31
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.52
 TOTAL AREA(ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
   1
          377.91 16.67 2.696 0.75(0.31) 0.42
                                             176.1 21040.00
          394.82 24.82 2.123 0.75(0.32) 0.43
                                             243.2 21020.00
                                              252.1 21010.00
          380.83 27.41 2.000 0.75(0.32) 0.43
          379.83 27.55
                      1.994 0.75(0.32)0.43
                                             252.5 21000.00
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.71;24H= 6.13
 S-GRAPH: VALLEY(DEV.) = 69.9%; VALLEY(UNDEV.) / DESERT = 30.1%
       MOUNTAIN= 0.0\%; FOOTHILL= 0.0\%; DESERT (UNDEV.) = 0.0\%
 Tc(HR) = 0.81; LAG(HR) = 0.64; Fm(INCH/HR) = 0.51; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10359.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222; Lca/L=0.6,n=.0207
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2606.95
 PEAK FLOW RATE (CFS) = 6141.10
*******************
 FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 21044.00 TO NODE 21045.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1318.00 DOWNSTREAM(FEET) = 1295.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1385.05 CHANNEL SLOPE = 0.0166
 CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50
```

File name: LR021077.RFS

Page 26

Date: 04/21/2014

FLOWDEPTH IN BOX IS 7.42 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 35.44

```
TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 50.39
 CHANNEL FLOW THRU SUBAREA(CFS) = 6141.10
 FLOW VELOCITY (FEET/SEC.) = 33.09 FLOW DEPTH (FEET) = 6.59
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
 TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 49.00
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET.
                                                                              FLOW PROCESS FROM NODE 21046.00 TO NODE 21046.00 IS CODE = 81
FLOW PROCESS FROM NODE 21045.00 TO NODE 21045.00 IS CODE = 81
                                                                              >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                            ______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                              MAINLINE Tc (MIN.) = 50.39
______
                                                                              * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.388
 MAINLINE Tc (MIN.) = 49.00
                                                                              SUBAREA LOSS RATE DATA (AMC II):
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.411
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          22.52
                                                                                                                           0.100
                                    Fρ
                                               Дp
                                                     SCS
                                                                              COMMERCIAL
                                                                                                  A
                                                                                                                    0.98
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              RESIDENTIAL
                                                                                                          7.83
                                                                                                                    0.98
                                                                                                                           0.600
 RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE"
                                                                                                 A
 "5-7 DWELLINGS/ACRE"
                            25.15
                                       0.98
                                              0.500
                                                    32
                                                                              COMMERCIAL
                                                                                                         38.49
                                                                                                                    0.75
                                                                                                                           0.100
                       Α
                                                                                                    B
 COMMERCIAL
                             34.08
                                       0.98
                                              0.100
                                                     32
                                                                                                    A
                                                                                                           8.61
                                                                                                                    0.98
                                                                                                                           0.850
                       A
                                                                              PUBLIC PARK
                       A
                            9.02
                                       0.98
                                              0.600
                                                    32
                                                                              RESIDENTIAL
 SCHOOL
                                                                              "3-4 DWELLINGS/ACRE"
                                                                                                  в 4.45
 RESIDENTIAL
                                                                                                                    0.75
                                                                                                                           0.600
                                                                                                    В
 "3-4 DWELLINGS/ACRE"
                       A 6.36
                                       0.98
                                              0.600
                                                     32
                                                                                                           0.52
                                                                                                                    0.75 0.250
                                                                              MOBILE HOME PARK
 COMMERCIAL
                              60.62
                                       0.75
                                              0.100 56
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
 RESIDENTIAL
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.254
 "3-4 DWELLINGS/ACRE" B 23.64
                                       0.75 0.600 56
                                                                              SUBAREA AREA(ACRES) = 82.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
                                                                              UNIT-HYDROGRAPH DATA:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
                                                                              RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.11
 SUBAREA AREA(ACRES) = 158.87
                                                                              S-GRAPH: VALLEY(DEV.) = 70.6%; VALLEY(UNDEV.) / DESERT = 29.4%
 UNIT-HYDROGRAPH DATA:
                                                                                     MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.12
                                                                              Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.51; Ybar = 0.51
 S-GRAPH: VALLEY(DEV.) = 70.3%; VALLEY(UNDEV.) / DESERT = 29.7%
                                                                              USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                              DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
 Tc(HR) = 0.82; LAG(HR) = 0.65; Fm(INCH/HR) = 0.51; Ybar = 0.51
                                                                              3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                              UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10600.7
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10518.3
                                                                              Lca/L=0.3,n=.0257; Lca/L=0.4,n=.0230; Lca/L=0.5,n=.0212; Lca/L=0.6,n=.0197
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET.
                                                                              TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2685.67
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                              UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 6087.60
  Lca/L=0.3,n=.0265; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0218; Lca/L=0.6,n=.0204
                                                                              TOTAL AREA(ACRES) = 10600.7
                                                                                                            PEAK FLOW RATE(CFS) = 6166.87
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2658.39
                                                                              NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 6166.87
 TOTAL AREA(ACRES) = 10518.3 PEAK FLOW RATE(CFS) = 6166.87
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                            ******************
                                                                              FLOW PROCESS FROM NODE 21046.00 TO NODE 21069.00 IS CODE = 54
*****************
                                                                            ______
 FLOW PROCESS FROM NODE 21045.00 TO NODE 21046.00 IS CODE = 54
                                                                              >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                              >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                            ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1250.00 DOWNSTREAM(FEET) = 1215.00
_____
                                                                              CHANNEL LENGTH THRU SUBAREA (FEET) = 2718.03 CHANNEL SLOPE = 0.0129
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1250.00
                                                                              CHANNEL BASE (FEET) = 18.00 "Z" FACTOR = 2.000
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2744.77 CHANNEL SLOPE = 0.0164
                                                                              MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000
                                                                              CHANNEL FLOW THRU SUBAREA(CFS) = 6166.87
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50
                                                                              FLOW VELOCITY (FEET/SEC.) = 29.88 FLOW DEPTH (FEET) = 6.61
 CHANNEL FLOW THRU SUBAREA(CFS) = 6166.87
                                                                              TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 51.91
 FLOW VELOCITY (FEET/SEC.) = 32.99 FLOW DEPTH (FEET) = 6.62
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
```

Page 27

Date: 04/21/2014

File name: LR021077.RFS

Date: 04/21/2014 File name: LR021077.RFS Page 28

SCS

32

32

56

56

56

```
******************
 FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 51.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.364
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                             5.29
                                      0.75
                                              0.600
                                                   56
 COMMERCIAL
                       В
                              24.38
                                      0.75
                                              0.100
 COMMERCIAL
                       Α
                             9.45
                                      0.98
                                              0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       Α
                              1.36
                                      0.98
                                              0.600
                                                   32
 PUBLIC PARK
                              5.30
                                      0.98
                                              0.850
                       Α
 PUBLIC PARK
                      В
                              0.69
                                      0.75
                                              0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
 SUBAREA AREA (ACRES) = 46.47
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.11
 S-GRAPH: VALLEY(DEV.) = 70.7%; VALLEY(UNDEV.) / DESERT = 29.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.87; LAG(HR) = 0.69; Fm(INCH/HR) = 0.51; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10647.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0250; Lca/L=0.4, n=.0224; Lca/L=0.5, n=.0206; Lca/L=0.6, n=.0192
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2699.17
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 6111.43
 TOTAL AREA(ACRES) = 10647.2
                             PEAK FLOW RATE (CFS) = 6166.87
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77
*********************
 FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 21050.00 TO NODE 21050.50 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 520.56
 ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1250.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.802
 SUBAREA TC AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                      Fp
                                                 Aр
                                                        SCS Tc
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
                              2.98
                                         0.98
                                                 0.500
 "5-7 DWELLINGS/ACRE"
                      A
                                                         32 12.02
                                                         32 9.40
 COMMERCIAL
                       A
                                5.49
                                         0.98
                                                 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        A 0.85
                                         0.98
                                                 0.600
                                                         32 12.73
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA RUNOFF (CFS) = 29.66
 TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) =
                                                    29.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.88; 24HR = 3.38
******************
 FLOW PROCESS FROM NODE 21050.50 TO NODE 21051.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1250.00 DOWNSTREAM ELEVATION(FEET) = 1246.00
 STREET LENGTH (FEET) = 343.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.29
 STREET FLOW TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 10.90
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.479
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                      Fp
                                                  Αр
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                            2.98
                                         0.98
                                                 0.500
                      A
                                                         32
 COMMERCIAL
                              5.50
                                         0.98
                                                 0.100
                                                         32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       A 0.85
                                         0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA AREA(ACRES) = 9.33
                                SUBAREA RUNOFF (CFS) = 26.97
```

File name: LR0210ZZ.RES

Page 30

Date: 04/21/2014

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.396

```
EFFECTIVE AREA(ACRES) = 18.65 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA(ACRES) = 18.6 PEAK FLOW RATE(CFS) =
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 4.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.88; 24HR = 3.38
                                                                                   DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 31.13
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.99 DEPTH*VELOCITY (FT*FT/SEC.) = 3.81
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.09
                                                                                        AND L = 756.6 FT WITH ELEVATION-DROP = 10.0 FT, IS 64.2 CFS,
 FLOW VELOCITY (FEET/SEC.) = 4.05 DEPTH*VELOCITY (FT*FT/SEC.) = 2.60
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21052.00
                                                                                   LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21052.00 = 1620.30 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 343.1 FT WITH ELEVATION-DROP = 4.0 FT, IS 33.9 CFS,
                                                                                 ******************
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21051.00
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21051.00 = 863.66 FEET.
                                                                                   FLOW PROCESS FROM NODE 21052.00 TO NODE 21067.00 IS CODE = 63
******************
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 21051.00 TO NODE 21052.00 IS CODE = 63
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 ______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   UPSTREAM ELEVATION(FEET) = 1236.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   STREET LENGTH (FEET) = 1432.84 CURB HEIGHT (INCHES) = 6.0
_____
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 1246.00 DOWNSTREAM ELEVATION(FEET) = 1236.00
 STREET LENGTH (FEET) = 756.64 CURB HEIGHT (INCHES) = 6.0
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    STREET FLOW DEPTH(FEET) = 0.89
   ***STREET FLOWING FULL***
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 37.42
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.11
   STREET FLOW DEPTH(FEET) = 0.71
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.54
   HALFSTREET FLOOD WIDTH (FEET) = 28.57
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 4.67 Tc (MIN.) = 18.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.74
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.554
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.37
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 2.66 Tc (MIN.) = 13.56
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                          SCS
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.051
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   RESIDENTIAL
                                                                                   "5-7 DWELLINGS/ACRE" A 17.32
                                                                                                                           0.98
                                                                                                                                   0.500
                                                                                                                                           32
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                          B 1.30
                                                                                                                           0.75
                                                                                                                                   0.600
                                                                                                                                           56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.87
                                                 0.500 32
                                         0.98
                                                                                   RESIDENTIAL
                       A 17.40
                                                                                                        B
 COMMERCIAL
                                         0.98
                                                 0.100 32
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                                5.92
                                                                                                                           0.75
                                                                                                                                   0.500
                                                                                                                                           56
 RESIDENTIAL
                                                                                   COMMERCIAL
                                                                                                        В
                                                                                                                6.47
                                                                                                                           0.75
                                                                                                                                   0.100
                                                                                                                                           56
 "3-4 DWELLINGS/ACRE" A 1.43 0.98
                                               0.600 32
                                                                                                        A 13.55
                                                                                                                                   0.100
                                                                                   COMMERCIAL
                                                                                                                           0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                                   RESIDENTIAL
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.171
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                                1.00
                                                                                                                          0.98 0.600
                                                                                                        A
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.91
 SUBAREA AREA (ACRES) = 20.70 SUBAREA RUNOFF (CFS) = 53.74
 EFFECTIVE AREA(ACRES) = 39.35 AREA-AVERAGED Fm(INCH/HR) = 0.21
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.329
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.22
                                                                                  SUBAREA AREA(ACRES) = 45.56 SUBAREA RUNOFF(CFS) = 92.47
                                                                                   EFFECTIVE AREA(ACRES) = 84.91 AREA-AVERAGED Fm(INCH/HR) = 0.26
 TOTAL AREA (ACRES) = 39.3 PEAK FLOW RATE (CFS) = 100.48
```

Date: 04/21/2014

File name: LR0210ZZ.RES

Page 32

```
AREA-AVERAGED Fp(INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) =
                    84.9
                              PEAK FLOW RATE (CFS) = 175.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.05
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 40.11
 FLOW VELOCITY (FEET/SEC.) = 5.33 DEPTH*VELOCITY (FT*FT/SEC.) = 5.02
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.26
 PIPE-FLOW(CFS) = 57.42
 PIPEFLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 14.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.887
 SUBAREA AREA (ACRES) = 45.56 SUBAREA RUNOFF (CFS) = 106.11
 TOTAL AREA (ACRES) = 84.9 PEAK FLOW RATE (CFS) = 200.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.05
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 143.37
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 37.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.48
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21067.00 = 3053.14 FEET.
FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.87
 RAINFALL INTENSITY (INCH/HR) = 2.89
 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.93
 AREA-AVERAGED Ap = 0.28
 EFFECTIVE STREAM AREA(ACRES) = 84.91
 TOTAL STREAM AREA(ACRES) = 84.91
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 200.78
*****
 FLOW PROCESS FROM NODE 21060.00 TO NODE 21061.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1000.00
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1268.00 DOWNSTREAM(FEET) = 1267.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 19.181
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.478
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS Tc
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.55
                                         0.98 0.500
                                                        32 24.54
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 1.16 0.98 0.600 32 26.00
 COMMERCIAL
                        Α
                                6.97 0.98 0.100 32 19.18
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.224
 SUBAREA RUNOFF (CFS) = 19.68
 TOTAL AREA (ACRES) = 9.68 PEAK FLOW RATE (CFS) = 19.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 21061.00 TO NODE 21062.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1267.00 DOWNSTREAM ELEVATION(FEET) = 1266.00
 STREET LENGTH (FEET) = 371.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   29.33
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.87
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.33
 STREET FLOW TRAVEL TIME (MIN.) = 3.31 Tc (MIN.) = 22.49
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.252
 SUBAREA LOSS RATE DATA (AMC II):
                    SCS SOIL AREA
 DEVELOPMENT TYPE/
                                      Fρ
                                                 αA
                                                        SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      A 1.79
                                         0.98
                                                 0.500
                                                        32
                              7.48
                                         0.98
                                                0.100
                                                        32
 COMMERCIAL
                      A
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.27
                                         0.98
                                                0.600
       Date: 04/21/2014
                       File name: LR0210ZZ.RES
                                                      Page 34
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.228
 SUBAREA AREA(ACRES) = 10.54 SUBAREA RUNOFF(CFS) = 19.26
 EFFECTIVE AREA(ACRES) = 20.22 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.23
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.39
 FLOW VELOCITY (FEET/SEC.) = 2.03 DEPTH*VELOCITY (FT*FT/SEC.) = 1.53
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 371.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 31.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21062.00
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21062.00 = 1371.00 FEET.
******************
 FLOW PROCESS FROM NODE 21062.00 TO NODE 21063.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1266.00 DOWNSTREAM ELEVATION(FEET) = 1265.00
 STREET LENGTH (FEET) = 228.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.48
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.85
 STREET FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 24.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.166
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                  αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     A 1.53
                                         0.98
                                                  0.500 32
                       A 4.98
 COMMERCIAL
                                         0.98
                                                  0.100 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 0.48
                                         0.98
                                                 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.222
 SUBAREA AREA(ACRES) = 6.99 SUBAREA RUNOFF(CFS) = 12.27
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.23
 TOTAL AREA (ACRES) = 27.2 PEAK FLOW RATE (CFS) = 47.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.51
 FLOW VELOCITY (FEET/SEC.) = 2.59 DEPTH*VELOCITY (FT*FT/SEC.) = 1.96
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21063.00 = 1599.50 FEET.
*******************
 FLOW PROCESS FROM NODE 21063.00 TO NODE 21064.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1265.00 DOWNSTREAM ELEVATION(FEET) = 1258.00
 STREET LENGTH (FEET) = 323.58 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.91
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    56.05
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 25.15
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.106
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
                     A 4.16 0.98 0.500
A 5.34 0.98 0.100
 "5-7 DWELLINGS/ACRE"
                                                          32
                                                         32
 COMMERCIAL
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" A 0.77 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.300
 SUBAREA AREA (ACRES) = 10.27 SUBAREA RUNOFF (CFS) = 16.77
 EFFECTIVE AREA(ACRES) = 37.48 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.25
 TOTAL AREA (ACRES) = 37.5 PEAK FLOW RATE (CFS) =
                                                           62.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

File name: LR0210ZZ.RES

Page 36

Date: 04/21/2014

EFFECTIVE AREA(ACRES) = 27.21 AREA-AVERAGED Fm(INCH/HR) = 0.22

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.15
 FLOW VELOCITY (FEET/SEC.) = 4.83 DEPTH*VELOCITY (FT*FT/SEC.) = 3.20
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21064.00 = 1923.08 FEET.
FLOW PROCESS FROM NODE 21064.00 TO NODE 21065.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1258.00 DOWNSTREAM ELEVATION(FEET) = 1254.00
 STREET LENGTH (FEET) = 294.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.03
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.43
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 28.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.11
 STREET FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 26.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.051
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A
                               4.73
                                        0.98
                                                0.500 32
                      A
                              3.54
                                        0.98
                                                0.100 32
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.55
                                        0.98
                                                0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.372
 SUBAREA AREA (ACRES) = 9.82 SUBAREA RUNOFF (CFS) = 14.92
 EFFECTIVE AREA(ACRES) = 47.30 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 TOTAL AREA (ACRES) = 47.3 PEAK FLOW RATE (CFS) =
                                                         76.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.48
 FLOW VELOCITY (FEET/SEC.) = 4.43 DEPTH*VELOCITY (FT*FT/SEC.) = 3.26
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21065.00 = 2217.58 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1254.00 DOWNSTREAM ELEVATION(FEET) = 1230.00
 STREET LENGTH (FEET) = 1452.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  81.71
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.73
  HALFSTREET FLOOD WIDTH (FEET) = 29.23
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.84
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 STREET FLOW TRAVEL TIME (MIN.) = 5.00 Tc (MIN.) = 31.29
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.847
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                              αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 2.04
                                       0.98
                                               0.600
 COMMERCIAL
                      A
                              5.75 0.98 0.100 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.231
 SUBAREA AREA (ACRES) = 7.79 SUBAREA RUNOFF (CFS) = 11.37
 EFFECTIVE AREA(ACRES) = 55.09 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 TOTAL AREA (ACRES) = 55.1 PEAK FLOW RATE (CFS) = 78.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.15
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 28.93
 FLOW VELOCITY (FEET/SEC.) = 4.77 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21066.00 = 3669.58 FEET.
******************
 FLOW PROCESS FROM NODE 21066.00 TO NODE 21067.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
 STREET LENGTH (FEET) = 858.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
```

File name: LR021077.RFS

Page 38

Date: 04/21/2014

FLOW PROCESS FROM NODE 21065.00 TO NODE 21066.00 IS CODE = 63

Date: 04/21/2014 File name: LR0210ZZ.RES Page 37

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                               ** CONFLUENCE DATA **
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                       Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                               NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                1
                                                                                        200.78 14.87 2.887 0.93 (0.26) 0.28 84.9 21050.00
                                                                                        78.75 34.63 1.738 0.97(0.25) 0.26 57.6 21060.00
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                               CONFLUENCE FORMULA USED FOR 2 STREAMS.
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               ** PEAK FLOW RATE TABLE **
   ***STREET FLOWING FULL***
                                                                                       Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               NUMBER
                                                                                                                           (ACRES) NODE
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR)
   STREET FLOW DEPTH (FEET) = 0.76
                                                                                1
                                                                                        260.72 14.87 2.887 0.94 (0.26) 0.27 109.6 21050.00
   HALFSTREET FLOOD WIDTH (FEET) = 30.88
                                                                                        191.74 34.63 1.738 0.95(0.26) 0.27 142.5 21060.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.27
                                                                               COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 STREET FLOW TRAVEL TIME (MIN.) = 3.35 Tc (MIN.) = 34.63
                                                                               PEAK FLOW RATE (CFS) = 260.72 Tc (MIN.) = 14.87
                                                                               EFFECTIVE AREA(ACRES) = 109.64 AREA-AVERAGED Fm(INCH/HR) = 0.26
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.738
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.27
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                                                                               TOTAL AREA (ACRES) = 142.5
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
     LAND USE
                      B 1.85 0.75 0.100 56
 COMMERCIAL
                                                                             *******************
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                             0.05
                                       0.75
                                               0.600 56
                                                                              FLOW PROCESS FROM NODE 21067.00 TO NODE 21068.00 IS CODE = 33
                               0.62
                                       0.98 0.100 32
                                                                             _____
 COMMERCIAL
                      A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
                                                                              >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.110
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 SUBAREA AREA (ACRES) = 2.52 SUBAREA RUNOFF (CFS) = 3.74
                                                                             EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1220.00
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.26
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1217.50
                                                                               FLOW LENGTH (FEET) = 1347.88 MANNING'S N = 0.013
 TOTAL AREA(ACRES) = 57.6
                             PEAK FLOW RATE (CFS) = 78.75
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.15
                                                                               PIPE-FLOW VELOCITY(FEET/SEC.) = 6.59
                                                                               PIPE-FLOW(CFS) = 253.73
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               PIPEFLOW TRAVEL TIME (MIN.) = 3.41 Tc (MIN.) = 18.28
 DEPTH (FEET) = 0.76 HALFSTREET FLOOD WIDTH (FEET) = 30.64
                                                                              * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.551
 FLOW VELOCITY (FEET/SEC.) = 4.25 DEPTH*VELOCITY (FT*FT/SEC.) = 3.22
                                                                               SUBAREA LOSS RATE DATA(AMC II):
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fp
                                                                                                                          Дp
                                                                                                                                   SCS
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  LAND USE
******************
                                                                               RESIDENTIAL
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                A 7.32
                                                                                                                     0.98
                                                                                                                             0.600
                                                                                                                                    32
______
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                 B 5.09
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                                                     0.75
                                                                                                                            0.600
                                                                                                                                    56
                                                                                                     A 15.30
                                                                                                                     0.98
                                                                                                                            0.100
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                               COMMERCIAL
_____
                                                                                                           41.62
                                                                                                                            0.100
                                                                               COMMERCIAL
                                                                                                     В
                                                                                                                     0.75
 TOTAL NUMBER OF STREAMS = 2
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
                                                                                                           SUBAREA RUNOFF (CFS) = 149.10
 TIME OF CONCENTRATION (MIN.) = 34.63
                                                                               SUBAREA AREA(ACRES) = 69.33
 RAINFALL INTENSITY (INCH/HR) = 1.74
                                                                               EFFECTIVE AREA(ACRES) = 178.97 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.97
                                                                               TOTAL AREA (ACRES) = 211.9 PEAK FLOW RATE (CFS) =
                                                                                                                                  375.34
 AREA-AVERAGED Ap = 0.26
 EFFECTIVE STREAM AREA(ACRES) = 57.61
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL STREAM AREA(ACRES) = 57.61
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.00; 6HR = 2.69; 24HR = 4.84
```

PEAK FLOW RATE (CFS) AT CONFLUENCE =

78.75

Date: 04/21/2014 File name: LR0210ZZ.RES Page 39

File name: LR0210ZZ.RES

Date: 04/21/2014

Page 40

```
STREET CROSS-SECTION INFORMATION:
                                                                                    FLOW PROCESS FROM NODE 21068.00 TO NODE 21069.00 IS CODE = 33
CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 39.00
                                                                                   ______
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                    >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                   ______
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    UPSTREAM NODE ELEVATION (FEET) = 1217.50
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    DOWNSTREAM NODE ELEVATION (FEET) = 1215.00
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    FLOW LENGTH (FEET) = 1146.78 MANNING'S N = 0.013
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
                                                                                    USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                    PIPE-FLOW VELOCITY (FEET/SEC.) = 7.64
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 121.61
                                                                                    PIPE-FLOW(CFS) = 360.86
 ***STREET FLOWING FULL***
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 2.50 Tc (MIN.) = 18.81
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.507
 STREET FLOW DEPTH(FEET) = 1.12
                                                                                    SUBAREA LOSS RATE DATA(AMC II):
 HALFSTREET FLOOD WIDTH (FEET) = 61.64
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                           Fр
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.20
                                                                                        LAND USE
                                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
                                                                                    RESIDENTIAL
                                                                                    "3-4 DWELLINGS/ACRE"
                                                                                                         В
                                                                                                                   1.21 0.75
                                                                                                                   33.09 0.98 0.100
*DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
                                                                                    COMMERCIAL
                                                                                    PUBLIC PARK
                                                                                                                  0.04 0.75 0.850 56
*REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
                                                                                                           B
ESTIMATED PIPE DIAMETER(INCH) = 60.00 NUMBER OF PIPES = 1
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
DEPTH OF FLOW IN 60.0 INCH PIPE IS 47.5 INCHES
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118
PIPE-FLOW VELOCITY (FEET/SEC.) = 15.63
                                                                                    SUBAREA AREA (ACRES) = 34.34 SUBAREA RUNOFF (CFS) = 74.08
                                                                                    EFFECTIVE AREA(ACRES) = 213.31 AREA-AVERAGED Fm(INCH/HR) = 0.24
PIPE-FLOW(CFS) = 260.72
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.26
PIPEFLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 16.30
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.732
                                                                                    TOTAL AREA (ACRES) = 246.2 PEAK FLOW RATE (CFS) = 435.02
SUBAREA AREA(ACRES) = 69.33 SUBAREA RUNOFF(CFS) = 160.39
TOTAL AREA (ACRES) = 211.9
                                PEAK FLOW RATE (CFS) = 404.49
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.88; 6HR = 2.44; 24HR = 4.76
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 143.77
                                                                                    STREET CROSS-SECTION INFORMATION:
 ***STREET FLOWING FULL***
                                                                                    CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 STREET FLOW DEPTH(FEET) = 1.17
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 HALFSTREET FLOOD WIDTH (FEET) = 64.39
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.31
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.72
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
*PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                    *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
      AND L = 1347.9 FT WITH ELEVATION-DROP = 2.5 FT, IS 144.9 CFS,
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE To :
      WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21068.00
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 74.15
                                                                                      ***STREET FLOWING FULL***
** PEAK FLOW RATE TABLE **
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                      STREET FLOW DEPTH (FEET) = 0.96
 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 53.83
  1
         404.49 16.30 2.732 0.91(0.22) 0.24 179.0 21050.00
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.00
         271.85 37.73 1.651 0.92(0.23) 0.24
   2
                                                 211.9 21060.00
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE (CFS) = 404.49 Tc (MIN.) = 16.30
                                                                                    *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp(INCH/HR) = 0.91
                                                                                    *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
AREA-AVERAGED Ap = 0.24 EFFECTIVE AREA(ACRES) = 178.97
                                                                                    ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21068.00 = 5875.96 FEET.
                                                                                    DEPTH OF FLOW IN 69.0 INCH PIPE IS 53.9 INCHES
                                                                                    PIPE-FLOW VELOCITY(FEET/SEC.) = 18.59
```

Page 41

Date: 04/21/2014

File name: LR021077.RFS

Date: 04/21/2014 File name: LR0210ZZ.RES Page 42

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

0.600

56

32

```
PIPE-FLOW(CFS) = 404.49
 PIPEFLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 17.33
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.633
 SUBAREA AREA(ACRES) = 34.34 SUBAREA RUNOFF(CFS) = 77.97
 TOTAL AREA (ACRES) = 246.2
                              PEAK FLOW RATE (CFS) = 459.15
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 54.66
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 47.50
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.65
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
 PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1146.8 FT WITH ELEVATION-DROP = 2.5 FT, IS 78.0 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21069.00
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                        HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          466.60 17.33 2.633 0.92(0.20) 0.22 213.3 21050.00
    1
    2
          306.83 40.01 1.594 0.92(0.21)0.23 246.2 21060.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 466.60 Tc (MIN.) = 17.33
 AREA-AVERAGED Fm(INCH/HR) = 0.20 AREA-AVERAGED Fp(INCH/HR) = 0.92
 AREA-AVERAGED Ap = 0.22 EFFECTIVE AREA(ACRES) = 213.31
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
                                         Ap Ae
  STREAM
            O Tc Intensity Fp(Fm)
                                                        HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          466.60 17.33 2.633 0.92(0.20) 0.22 213.3 21050.00
    2
          306.83 40.01 1.594 0.92(0.21) 0.23 246.2 21060.00
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 6166.87 Tc (MIN.) = 51.91
 AREA-AVERAGED Fm(INCH/HR) = 0.51 Ybar = 0.51
 TOTAL AREA (ACRES) = 10647.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.71;24H= 6.07
 S-GRAPH: VALLEY(DEV.) = 71.4%; VALLEY(UNDEV.) / DESERT = 28.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.87; LAG(HR) = 0.69; Fm(INCH/HR) = 0.50; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.66; 1HR = 0.67;
```

```
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10893.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0250; Lca/L=0.4,n=.0224; Lca/L=0.5,n=.0206; Lca/L=0.6,n=.0192
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2772.09
 PEAK FLOW RATE (CFS) = 6262.02
******************
 FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
FLOW PROCESS FROM NODE 21069.00 TO NODE 21070.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1215.00 DOWNSTREAM(FEET) = 1183.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2795.47 CHANNEL SLOPE = 0.0114
 CHANNEL BASE (FEET) = 18.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 6262.02
 FLOW VELOCITY (FEET/SEC.) = 28.77 FLOW DEPTH (FEET) = 6.86
 TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 53.53
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 53.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.339
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             qΑ
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     в 108.13 0.75
                                             0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.27 0.75 0.600
                                                    56
 PUBLIC PARK
                            5.11
                                     0.75
                                             0.850
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196
 SUBAREA AREA (ACRES) = 130.51
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.97;6H= 2.71;24H= 6.06
 S-GRAPH: VALLEY(DEV.) = 71.7%; VALLEY(UNDEV.)/DESERT= 28.3%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.89; LAG(HR) = 0.71; Fm(INCH/HR) = 0.50; Ybar = 0.50
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0244; Lca/L=0.4,n=.0219; Lca/L=0.5,n=.0201; Lca/L=0.6,n=.0188
```

File name: LR0210ZZ.RES

Page 44

3HR = 0.94; 6HR = 0.97; 24HR = 0.98

Date: 04/21/2014

TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2814.88 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6261.94 TOTAL AREA (ACRES) = 11023.9 PEAK FLOW RATE (CFS) = 6262.02NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 152 \_\_\_\_\_\_ >>>>STORE PEAK FLOWRATE TABLE TO A FILE< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 21070.DNA \_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 11023.9 TC (MIN.) = 53.53 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.50PEAK FLOW RATE (CFS) = 6262.02\_\_\_\_\_

\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0210ZZ.RES Page 45 Date: 04/21/2014 File name: LR0210ZZ.RES Page 46

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21167

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT 3

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0211ZZ.DAT

TIME/DATE OF STUDY: 14:16 02/28/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-GEOMETRIES:		RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

18	26.0	15.0	0.020/0.020 0.020/0.020 0.020/0.020	/0.020	0.67	2.00	0.0312 0	.167	0.0180
GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  1. Relative Flow-Depth = 0.20 FEET    as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)  2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED									
UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  WATERSHED LAG = 0.80 * Tc  USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF  1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED.  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*									
			*********** DE 21100.00						*****
	>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<								
INITIAL SUBAREA FLOW-LENGTH(FEET) = 678.31 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1820.00 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.418									
SUI Di	BAREA TO A EVELOPMENT LAND US	ND LOSS I	INTENSITY(IN RATE DATA(AM SCS SOIL GROUP	C II):		/HR) (	Ap DECIMAL)	SCS CN	Tc (MIN.)
"3- RES "2 SUI SUI	SIDENTIAL DWELLINGS BAREA AVEF BAREA AVEF BAREA RUNC	G/ACRE"  RAGE PERVI	B  B  IOUS LOSS RA  IOUS AREA FR  = 22.07  7.47	6.56 TE, Fp(I ACTION,	0 (NCH/HR) Ap = 0	.75 = 0.7	0.700 5	56	
TOTAL AREA (ACRES) = 7.47 PEAK FLOW RATE (CFS) = 22.07  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50									
**************************************									
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>									
ELEVATION DATA: UPSTREAM(FEET) = 1820.00 DOWNSTREAM(FEET) = 1770.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 733.55 CHANNEL SLOPE = 0.0682 CHANNEL BASE(FEET) = 0.00 "Z" FACTOR = 5.000									
	Date:	04/21/2014	File nan	ne: LR0211	IZZ.RES			Page 2	2

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 5.13 FLOW DEPTH (FEET) = 0.93
 TRAVEL TIME (MIN.) = 2.39 Tc (MIN.) = 11.80
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21102.00 = 1411.86 FEET.
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21102.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 11.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.316
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                           Ар
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 10.44
                                 0.75
                                          0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.19
                                 0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 12.63
                           SUBAREA RUNOFF (CFS) = 31.89
 EFFECTIVE AREA(ACRES) = 20.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 20.1
                           PEAK FLOW RATE(CFS) =
                                                 50.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21103.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1750.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 514.94 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 50.72
 FLOW VELOCITY (FEET/SEC.) = 5.07 FLOW DEPTH (FEET) = 1.41
 TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 13.50
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21103.00 = 1926.80 FEET.
*********************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21103.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 13.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.060
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                           Aр
                                                SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                          1.23
                                   0.75
                                          0.600
                                               56
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                          8.43 0.75 0.700 56
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
                            SUBAREA RUNOFF(CFS) = 22.13
 SUBAREA AREA(ACRES) = 9.66
 EFFECTIVE AREA(ACRES) = 29.76 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 29.8
                             PEAK FLOW RATE(CFS) =
                                                  68.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21104.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1715.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.67 CHANNEL SLOPE = 0.0530
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 68.22
 FLOW VELOCITY (FEET/SEC.) = 6.14 FLOW DEPTH (FEET) = 1.49
 TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 15.29
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21104.00 = 2587.47 FEET.
*************************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21104.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 15.29
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.839
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Ар
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        20.18
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 4.62
                                           0.600
                                                  56
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
 SUBAREA AREA(ACRES) = 24.80 SUBAREA RUNOFF(CFS) = 51.99
 EFFECTIVE AREA(ACRES) = 54.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 54.6 PEAK FLOW RATE (CFS) = 114.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21105.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH (FEET) = 402.43 CURB HEIGHT (INCHES) = 8.0
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 3

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 4

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 121.78
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.82
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.95
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 17.81
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.591
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               qΑ
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.35 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.77 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA(ACRES) = 6.12 SUBAREA RUNOFF(CFS) = 11.44
 EFFECTIVE AREA(ACRES) = 64.31 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 64.3 PEAK FLOW RATE (CFS) = 120.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.70
 FLOW VELOCITY (FEET/SEC.) = 6.47 DEPTH*VELOCITY (FT*FT/SEC.) = 4.92
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21106.00 = 3552.21 FEET.
******************
 FLOW PROCESS FROM NODE 21106.00 TO NODE 21107.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1690.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 483.05 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 126.99
   ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 6

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0211ZZ.RES Page 5

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.53
 STREET FLOW TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 18.87
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.503
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В 6.11 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.21 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 7.32 SUBAREA RUNOFF (CFS) = 13.12
 EFFECTIVE AREA(ACRES) = 71.63 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 71.6
                                PEAK FLOW RATE (CFS) = 128.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.17
 FLOW VELOCITY (FEET/SEC.) = 7.65 DEPTH*VELOCITY (FT*FT/SEC.) = 5.58
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21107.00 = 4035.26 FEET.
FLOW PROCESS FROM NODE 21107.00 TO NODE 21108.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 579.31 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 157.61
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.60
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 19.96
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.419
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Αp
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 28.69
                                         0.75 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.30 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 33.99 SUBAREA RUNOFF (CFS) = 58.35
 EFFECTIVE AREA(ACRES) = 105.62 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 105.6 PEAK FLOW RATE (CFS) =
                                                      181.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 31.55
 FLOW VELOCITY (FEET/SEC.) = 9.21 DEPTH*VELOCITY (FT*FT/SEC.) = 7.17
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 39.32
 PIPE-FLOW(CFS) = 123.64
 PIPEFLOW TRAVEL TIME (MIN.) = 0.25 Tc (MIN.) = 19.11
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.483
 SUBAREA AREA (ACRES) = 33.99 SUBAREA RUNOFF (CFS) = 60.31
 TOTAL AREA (ACRES) = 105.6 PEAK FLOW RATE (CFS) = 187.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 63.85
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.28
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.95
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21108.00 = 4614.57 FEET.
*******************
 FLOW PROCESS FROM NODE 21108.00 TO NODE 21109.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 1132.55 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 7 Date: 04/21/2014 File name: LR0211ZZ.RES

Page 8

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 206.81
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.85
 HALFSTREET FLOOD WIDTH (FEET) = 35.21
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.41
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.16
STREET FLOW TRAVEL TIME (MIN.) = 2.24 Tc (MIN.) = 21.35
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.323
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   Αp
                                                          SCS
                                       Fр
    LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"2 DWELLINGS/ACRE" B 21.44
                                          0.75
                                                   0.700 56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 2.32 0.75
                                                 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
SUBAREA AREA (ACRES) = 23.76 SUBAREA RUNOFF (CFS) = 38.64
EFFECTIVE AREA(ACRES) = 129.38 AREA-AVERAGED Fm(INCH/HR) = 0.51
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
TOTAL AREA(ACRES) = 129.4 PEAK FLOW RATE(CFS) = 210.92
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.46
FLOW VELOCITY (FEET/SEC.) = 8.46 DEPTH*VELOCITY (FT*FT/SEC.) = 7.24
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 35.13
PIPE-FLOW(CFS) = 139.80
PIPEFLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 19.65
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.442
SUBAREA AREA(ACRES) = 23.76 SUBAREA RUNOFF(CFS) = 41.19
TOTAL AREA (ACRES) = 129.4 PEAK FLOW RATE (CFS) = 224.78
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 84.99
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.67
 HALFSTREET FLOOD WIDTH (FEET) = 25.93
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.26
```

```
LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21109.00 = 5747.12 FEET.
FLOW PROCESS FROM NODE 21109.00 TO NODE 21110.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1550.00
 STREET LENGTH (FEET) = 761.67 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.89
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.69
 STREET FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 20.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.359
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.59 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 13.10
 EFFECTIVE AREA(ACRES) = 137.26 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 137.3 PEAK FLOW RATE(CFS) = 228.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.71
 FLOW VELOCITY (FEET/SEC.) = 10.77 DEPTH*VELOCITY (FT*FT/SEC.) = 8.63
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
```

File name: LR0211ZZ.RES

Page 10

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.21

Date: 04/21/2014

```
ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 47.89
 PIPE-FLOW(CFS) = 190.59
 PIPEFLOW TRAVEL TIME (MIN.) = 0.27 Tc (MIN.) = 19.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.423
 SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 13.56
 TOTAL AREA (ACRES) = 137.3 PEAK FLOW RATE (CFS) = 236.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 45.47
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 17.77
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.49
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21110.00 = 6508.79 FEET.
******************
 FLOW PROCESS FROM NODE 21110.00 TO NODE 21129.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1495.00
 FLOW LENGTH (FEET) = 1519.57 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 34.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.47
 PIPE-FLOW(CFS) = 236.06
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 20.95
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 20.95
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.350
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 21.30
                                    0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 21.30 SUBAREA RUNOFF (CFS) = 36.45
 EFFECTIVE AREA(ACRES) = 158.56 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 158.6 PEAK FLOW RATE (CFS) = 263.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

```
FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
 FLOW PROCESS FROM NODE 21121.00 TO NODE 21122.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 969.86
 ELEVATION DATA: UPSTREAM(FEET) = 1830.00 DOWNSTREAM(FEET) = 1770.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 11.254
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.412
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                    SCS Tc
                                              Αp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.27 0.75 0.600
                                                     56 11.25
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 5.70 0.75 0.700 56 11.96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA RUNOFF (CFS) = 18.21
 TOTAL AREA (ACRES) = 6.97 PEAK FLOW RATE (CFS) = 18.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39
*******************
 FLOW PROCESS FROM NODE 21122.00 TO NODE 21123.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 STREET LENGTH (FEET) = 1318.97 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.37
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.01
```

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 12

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.67
                                                                                  RESIDENTIAL.
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.53
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                          B 4.04
                                                                                                                           0.75
                                                                                                                                  0.600
 STREET FLOW TRAVEL TIME (MIN.) = 3.88 Tc (MIN.) = 15.13
                                                                                  RESIDENTIAL
                                                                                                        B 29.70 0.75 0.700
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.856
                                                                                  "2 DWELLINGS/ACRE"
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  SUBAREA AREA (ACRES) = 33.74 SUBAREA RUNOFF (CFS) = 58.27
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  EFFECTIVE AREA(ACRES) = 52.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.67
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                         0.75
                                                 0.600
                                                       56
                                                                                  TOTAL AREA (ACRES) = 52.2 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
                                                                                                                                           90.20
 "2 DWELLINGS/ACRE"
                      B 10.86 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
                                                                                   5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.89; 24HR = 3.41
 SUBAREA AREA (ACRES) = 11.53 SUBAREA RUNOFF (CFS) = 24.25
 EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                                  DEPTH (FEET) = 0.62 HALFSTREET FLOOD WIDTH (FEET) = 24.12
 TOTAL AREA (ACRES) = 18.5 PEAK FLOW RATE (CFS) =
                                                          38.97
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.30 DEPTH*VELOCITY (FT*FT/SEC.) = 4.54
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                        AND L = 1864.0 FT WITH ELEVATION-DROP = 75.0 FT, IS 68.5 CFS,
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21124.00
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.87; 24HR = 3.39
                                                                                  LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21124.00 = 4152.79 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.65
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.03 DEPTH*VELOCITY (FT*FT/SEC.) = 2.89
                                                                                   FLOW PROCESS FROM NODE 21124.00 TO NODE 21125.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21123.00 = 2288.83 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
>>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 _____
 FLOW PROCESS FROM NODE 21123.00 TO NODE 21124.00 IS CODE = 63
                                                                                   UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
                                                                                  STREET LENGTH (FEET) = 472.91 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 1863.96 CURB HEIGHT (INCHES) = 6.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     94.11
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.58
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 21.86
   ***STREET FLOWING FULL***
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.15
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.28
   STREET FLOW DEPTH(FEET) = 0.57
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 20.63
   HALFSTREET FLOOD WIDTH (FEET) = 21.74
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.372
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.71
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.85
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
 STREET FLOW TRAVEL TIME (MIN.) = 4.63 Tc (MIN.) = 19.77
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.434
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "2 DWELLINGS/ACRE" B 4.00
                                                                                                                           0.75
                                                                                                                                 0.700
                                                                                                                                          56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                               Дp
                                                        SCS
                                                                                  RESIDENTIAL
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "3-4 DWELLINGS/ACRE" B 0.67
                                                                                                                           0.75
                                                                                                                                  0.600
```

Page 13

Date: 04/21/2014

File name: LR0211ZZ.RES

Page 14

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 4.67 SUBAREA RUNOFF (CFS) = 7.81
 EFFECTIVE AREA(ACRES) = 56.91 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 56.9 PEAK FLOW RATE (CFS) =
                                                           95.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.92
 FLOW VELOCITY (FEET/SEC.) = 9.20 DEPTH*VELOCITY (FT*FT/SEC.) = 5.32
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21125.00 = 4625.70 FEET.
******************
 FLOW PROCESS FROM NODE 21125.00 TO NODE 21126.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH (FEET) = 502.51 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.81
 STREET FLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 21.75
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.298
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
                                                  Дp
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 4.19 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.64
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AREA (ACRES) = 5.83 SUBAREA RUNOFF (CFS) = 9.42
 EFFECTIVE AREA(ACRES) = 62.74 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 62.7 PEAK FLOW RATE (CFS) = 100.76
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.35; 6HR = 1.80; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.15
 FLOW VELOCITY (FEET/SEC.) = 7.53 DEPTH*VELOCITY (FT*FT/SEC.) = 4.84
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.
******************
 FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.75
 RAINFALL INTENSITY (INCH/HR) = 2.30
 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 62.74
 TOTAL STREAM AREA(ACRES) = 62.74
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 100.76
******************
 FLOW PROCESS FROM NODE 21150.00 TO NODE 21151.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 912.75
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1685.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.318
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.953
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS Tc
                                           αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 6.53 0.75 0.700
                                                 56 15.22
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.32
                                    0.75 0.600
                                                 56 14.32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA RUNOFF (CFS) = 15.00
 TOTAL AREA(ACRES) = 6.85 PEAK FLOW RATE(CFS) = 15.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 21151.00 TO NODE 21152.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1685.00 DOWNSTREAM ELEVATION(FEET) = 1630.00
```

File name: LR0211ZZ.RES

Page 16

Date: 04/21/2014

```
STREET LENGTH (FEET) = 659.39 CURB HEIGHT (INCHES) = 6.0
                                                                                    STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     STREET FLOW DEPTH(FEET) = 0.51
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.59
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.55
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 14.05
                                                                                        LAND USE
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.58
                                                                                    RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.68
                                                                                    "2 DWELLINGS/ACRE"
 STREET FLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 15.99
                                                                                    RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.764
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    NATURAL FAIR COVER
  DEVELOPMENT TYPE/ SCS SOIL AREA FD AD SCS
                                                                                    "OPEN BRUSH"
                                                                                                          В
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 10.34
                                          0.75
                                                  0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.04 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA(ACRES) = 12.38 SUBAREA RUNOFF(CFS) = 25.10
 EFFECTIVE AREA(ACRES) = 19.23 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 19.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.16
 FLOW VELOCITY (FEET/SEC.) = 7.13 DEPTH*VELOCITY (FT*FT/SEC.) = 3.20
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21152.00 = 1572.14 FEET.
******************
 FLOW PROCESS FROM NODE 21152.00 TO NODE 21153.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 730.95 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  49.90
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   HALFSTREET FLOOD WIDTH (FEET) = 18.38
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.38
 STREET FLOW TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 17.82
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.590
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                               Дp
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      B 6.40 0.75
                                                0.700
                                                        56
 "3-4 DWELLINGS/ACRE" B 1.41
                                        0.75
                                                0.600
                                                        56
                             4.11 0.61 1.000
                                                      66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.792
 SUBAREA AREA (ACRES) = 11.92 SUBAREA RUNOFF (CFS) = 21.93
 EFFECTIVE AREA(ACRES) = 31.15 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 31.1 PEAK FLOW RATE (CFS) =
                                                        57.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 7.03 DEPTH*VELOCITY (FT*FT/SEC.) = 3.71
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21153.00 = 2303.09 FEET.
******************
 FLOW PROCESS FROM NODE 21153.00 TO NODE 21126.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1590.00 DOWNSTREAM ELEVATION (FEET) = 1570.00
 STREET LENGTH (FEET) = 807.57 CURB HEIGHT (INCHES) = 6.0
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
```

File name: LR0211ZZ.RES

Page 18

Date: 04/21/2014

Date: 04/21/2014 Page 17 File name: LR0211ZZ.RES

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                           Q Tc Intensity Fp(Fm)
                                                  65.10
                                                                                                                       Ap Ae
   ***STREET FLOWING FULL***
                                                                                 NUMBER
                                                                                          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                              (ACRES) NODE
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 1
                                                                                         166.11 20.22 2.401 0.74(0.52) 0.70 98.0 21150.00
   STREET FLOW DEPTH(FEET) = 0.61
                                                                                         164.13 21.75 2.298 0.74(0.52) 0.70 102.4 21121.00
   HALFSTREET FLOOD WIDTH (FEET) = 23.32
                                                                                COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.40
                                                                                PEAK FLOW RATE (CFS) = 166.11 Tc (MIN.) = 20.22
 STREET FLOW TRAVEL TIME (MIN.) = 2.40 Tc (MIN.) = 20.22
                                                                                EFFECTIVE AREA(ACRES) = 98.00 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.401
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                TOTAL AREA (ACRES) = 102.4
                                                                                LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              ************************
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 7.02
                                                                                FLOW PROCESS FROM NODE 21126.00 TO NODE 21127.00 IS CODE = 63
                                        0.75
                                                0.700
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.50 0.75 0.600 56
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                                                                              ______
 SUBAREA AREA(ACRES) = 8.52 SUBAREA RUNOFF(CFS) = 14.50
                                                                                UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1557.00
 EFFECTIVE AREA(ACRES) = 39.67 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                STREET LENGTH (FEET) = 322.81 CURB HEIGHT (INCHES) = 6.0
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.72
                                                                                STREET HALFWIDTH (FEET) = 18.00
 TOTAL AREA (ACRES) = 39.7 PEAK FLOW RATE (CFS) =
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.63
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW VELOCITY(FEET/SEC.) = 5.64 DEPTH*VELOCITY(FT*FT/SEC.) = 3.45
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21126.00 = 3110.66 FEET.
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
*****
 FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
______
                                                                                  ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                  STREET FLOW DEPTH(FEET) = 0.75
______
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 30.65
 TOTAL NUMBER OF STREAMS = 2
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.63
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.50
 TIME OF CONCENTRATION (MIN.) = 20.22
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 20.84
 RAINFALL INTENSITY (INCH/HR) = 2.40
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.358
 AREA-AVERAGED Fm (INCH/HR) = 0.52
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp (INCH/HR) = 0.73
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
                                                                                    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Ap = 0.72
 EFFECTIVE STREAM AREA(ACRES) = 39.67
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE" B 2.16
                                                                                                                       0.75
                                                                                                                              0.700
 TOTAL STREAM AREA(ACRES) = 39.67
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 67.05
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 0.72 0.75 0.600
 ** CONFLUENCE DATA **
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                       HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                SUBAREA AREA (ACRES) = 2.88 SUBAREA RUNOFF (CFS) = 4.80
    1
          100.76 21.75 2.298 0.75(0.51) 0.69 62.7 21121.00
                                                                                EFFECTIVE AREA(ACRES) = 100.88 AREA-AVERAGED Fm(INCH/HR) = 0.52
          67.05 20.22 2.401 0.73(0.52) 0.72 39.7 21150.00
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
                                                                                TOTAL AREA (ACRES) = 105.3 PEAK FLOW RATE (CFS) = 167.09
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.79; 24HR = 3.39
```

HEADWATER

SCS

56

Date: 04/21/2014 File name: LR0211ZZ.RES Page 19 Date: 04/21/2014 File name: LR0211ZZ.RES Page 20

\*\* PEAK FLOW RATE TABLE \*\*

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.52
 FLOW VELOCITY (FEET/SEC.) = 8.63 DEPTH*VELOCITY (FT*FT/SEC.) = 6.47
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 34.68
 PIPE-FLOW(CFS) = 109.04
 PIPEFLOW TRAVEL TIME (MIN.) = 0.16 Tc (MIN.) = 20.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.390
 SUBAREA AREA(ACRES) = 2.88 SUBAREA RUNOFF(CFS) = 4.89
 TOTAL AREA (ACRES) = 105.3 PEAK FLOW RATE (CFS) = 170.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.79; 24HR = 3.39
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 60.99
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.82
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.61
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 170.03 20.37 2.390 0.74(0.52) 0.70 100.9 21150.00
    2 167.85 21.90 2.288 0.74(0.52) 0.70 105.3 21121.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 170.03 Tc (MIN.) = 20.37
 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.70 EFFECTIVE AREA(ACRES) = 100.88
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21127.00 = 5451.02 FEET.
**********************
 FLOW PROCESS FROM NODE 21127.00 TO NODE 21128.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1535.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 354.44 CHANNEL SLOPE = 0.0621
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 170.03
 FLOW VELOCITY (FEET/SEC.) = 11.43 FLOW DEPTH (FEET) = 1.61
 TRAVEL TIME (MIN.) = 0.52 Tc (MIN.) = 20.89
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21128.00 = 5805.46 FEET.
FLOW PROCESS FROM NODE 21128.00 TO NODE 21128.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

```
MAINLINE Tc (MIN.) = 20.89
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.354
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          Αp
   LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 10.17
                                   0.75 0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 45.95 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 56.12 SUBAREA RUNOFF (CFS) = 93.15
 EFFECTIVE AREA(ACRES) = 157.00 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
 TOTAL AREA (ACRES) = 161.4 PEAK FLOW RATE (CFS) = 257.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 NUMBER
  1
         259.94 20.89 2.354 0.74(0.51) 0.69 157.0 21150.00
   2 253.04 22.42 2.256 0.74(0.51) 0.69 161.4 21121.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 259.94 Tc (MIN.) = 20.89
 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.69 EFFECTIVE AREA(ACRES) = 157.00
******************
 FLOW PROCESS FROM NODE 21128.00 TO NODE 21129.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1495.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1036.57 CHANNEL SLOPE = 0.0386
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 259.94
 FLOW VELOCITY (FEET/SEC.) = 10.86 FLOW DEPTH (FEET) = 2.27
 TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 22.48
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
*******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
MAINLINE Tc (MIN.) = 22.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.253
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
  LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.92 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 21

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 22

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 17.92
                           SUBAREA RUNOFF (CFS) = 29.10
 EFFECTIVE AREA(ACRES) = 174.92 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 179.3 PEAK FLOW RATE (CFS) = 274.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM
        Q Tc Intensity Fp(Fm)
                                   Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         274.70 22.48 2.253 0.74(0.51) 0.68 174.9 21150.00
         267.41 24.02 2.165 0.74(0.51) 0.68 179.3 21121.00
    2
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
         0
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
         263.55 20.95 2.350 0.75(0.50) 0.67 158.6 21100.00
   1
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         533.83 20.95 2.350 0.75(0.51) 0.68 321.6 21100.00
         524.35 22.48 2.253 0.75(0.51) 0.68 333.5 21150.00
         504.51 24.02 2.165 0.75(0.51) 0.68 337.9 21121.00
  TOTAL AREA (ACRES) =
                     337.9
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 533.83 Tc (MIN.) = 20.949
 EFFECTIVE AREA(ACRES) = 321.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 337.9
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
______
*****************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21130.00 IS CODE = 42
._____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1495.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 FLOW LENGTH (FEET) = 1595.06 MANNING'S N = 0.013
```

```
USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 51.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 24.91
                 533.83
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 22.02
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21130.00 = 9623.42 FEET.
************************
 FLOW PROCESS FROM NODE 21130.00 TO NODE 21130.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 22.02
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.281
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                  SCS
   LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 64.12 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 64.12 SUBAREA RUNOFF(CFS) = 105.74
 EFFECTIVE AREA(ACRES) = 385.68 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 402.0
                             PEAK FLOW RATE(CFS) =
                                                  619.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
************************
 FLOW PROCESS FROM NODE 21130.00 TO NODE 21146.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1403.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1317.93 CHANNEL SLOPE = 0.0432
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 619.59
 FLOW VELOCITY (FEET/SEC.) = 14.07 FLOW DEPTH (FEET) = 3.10
 TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 23.58
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET.
******************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 23.58
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.189
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                            αA
                                                  SCS
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           22.28
                                    0.75
                                           0.600
      Date: 04/21/2014
                    File name: LR0211ZZ.RES
                                                 Page 24
```

```
AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      B 1.50 0.63 1.000 65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625
 SUBAREA AREA(ACRES) = 23.78
                             SUBAREA RUNOFF (CFS) = 37.01
 EFFECTIVE AREA(ACRES) = 409.46 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 425.8
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*******************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.58
 RAINFALL INTENSITY (INCH/HR) = 2.19
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 409.46
 TOTAL STREAM AREA(ACRES) = 425.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 624.71
************************
 FLOW PROCESS FROM NODE 21140.00 TO NODE 21141.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 286.67
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.750
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.268
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Ap SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.17 0.75 0.600 56 7.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 7.46
 TOTAL AREA (ACRES) = 2.17 PEAK FLOW RATE (CFS) = 7.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21141.00 TO NODE 21142.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
```

```
UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1445.00
 STREET LENGTH (FEET) = 752.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    13.19
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.11
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.00
 STREET FLOW TRAVEL TIME (MIN.) = 5.94 Tc (MIN.) = 13.69
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.034
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.85 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 4.85 SUBAREA RUNOFF (CFS) = 11.28
 EFFECTIVE AREA (ACRES) = 7.02 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 7.0 PEAK FLOW RATE (CFS) =
                                                            16.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 FLOW VELOCITY (FEET/SEC.) = 2.26 DEPTH*VELOCITY (FT*FT/SEC.) = 1.13
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21142.00 = 1039.27 FEET.
******************
 FLOW PROCESS FROM NODE 21142.00 TO NODE 21143.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1445.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 604.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
       Date: 04/21/2014
                        File name: LR0211ZZ.RES
                                                         Page 26
```

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  25.52
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.93
 STREET FLOW TRAVEL TIME (MIN.) = 2.47 Tc (MIN.) = 16.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.747
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.88 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 8.88 SUBAREA RUNOFF (CFS) = 18.36
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.26
 FLOW VELOCITY (FEET/SEC.) = 4.44 DEPTH*VELOCITY (FT*FT/SEC.) = 2.24
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21143.00 = 1643.57 FEET.
*****************
 FLOW PROCESS FROM NODE 21143.00 TO NODE 21144.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1413.00
 STREET LENGTH (FEET) = 592.37 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     38.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.81
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.56
 STREET FLOW TRAVEL TIME (MIN.) = 1.99 Tc (MIN.) = 18.15
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.562
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                              6.11 0.75 0.600 56
 "3-4 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 6.11 SUBAREA RUNOFF (CFS) = 11.62
 EFFECTIVE AREA(ACRES) = 22.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
                                                         41.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 5.09 DEPTH*VELOCITY (FT*FT/SEC.) = 2.68
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21144.00 = 2235.94 FEET.
*****************
 FLOW PROCESS FROM NODE 21144.00 TO NODE 21145.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1413.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 FLOW LENGTH (FEET) = 90.21 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 12.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.13
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.09 Tc (MIN.) = 18.24
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.554
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.65 0.75 0.600
                                                        56
 COMMERCIAL
                      B
                              1.61 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.547
 SUBAREA AREA(ACRES) = 15.26 SUBAREA RUNOFF(CFS) = 29.45
 EFFECTIVE AREA(ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 37.3 PEAK FLOW RATE (CFS) =
                                                         71.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 27 Date: 04/21/2014 File name: LR0211ZZ.RES Page 28

```
CURB HEIGHT (INCHES) = 6.0
                             STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 29.30
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
                                                                                      TOTAL NUMBER OF STREAMS = 2
   HALFSTREET FLOOD WIDTH (FEET) = 16.32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.38
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21145.00 = 2326.15 FEET.
                                                                                      AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                      AREA-AVERAGED Fp (INCH/HR) = 0.75
******************
                                                                                      AREA-AVERAGED Ap = 0.58
 FLOW PROCESS FROM NODE 21145.00 TO NODE 21146.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
                                                                                      ** CONFLUENCE DATA **
 UPSTREAM NODE ELEVATION (FEET) = 1409.00
                                                                                       NUMBER
 DOWNSTREAM NODE ELEVATION (FEET) = 1403.00
 FLOW LENGTH (FEET) = 538.70 MANNING'S N = 0.013
                                                                                         1
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
                                                                                         1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 24.0 INCHES
                                                                                                 71.15 19.05
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.87
 PIPE-FLOW(CFS) =
                    71.15
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 19.05
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.488
                                                                                      ** PEAK FLOW RATE TABLE **
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                       NUMBER
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
                                                                                         3
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA (ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA(ACRES) = 37.3
                                  PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      TOTAL AREA(ACRES) = 463.1
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                             STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                      CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
```

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 \*NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW; STREET HYDRAULICS NOT COMPUTED\* LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21146.00 = 2864.85 FEET. \* FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 1 \_\_\_\_\_\_ >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<< >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES \_\_\_\_\_ CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 19.05 RAINFALL INTENSITY (INCH/HR) = 2.49EFFECTIVE STREAM AREA(ACRES) = 37.27 TOTAL STREAM AREA(ACRES) = 37.27 PEAK FLOW RATE (CFS) AT CONFLUENCE = 71.15 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (ACRES) NODE (CFS) (MIN.) (INCH/HR) (INCH/HR) 623.12 23.65 2.185 0.75(0.49) 0.66 409.5 21100.00 610.26 25.20 2.104 0.75 (0.49) 0.66 421.4 21150.00 587.97 26.76 2.029 0.75(0.49) 0.66 425.8 21121.00 2.488 0.75(0.43)0.58 37.3 21140.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 662.88 19.05 2.488 0.75(0.49) 0.65 366.9 21140.00 683.77 23.65 2.185 0.75(0.49) 0.66 446.7 21100.00 668.09 25.20 2.104 0.75(0.49) 0.66 458.6 21150.00 643.22 26.76 2.029 0.75 (0.49) 0.66 463.1 21121.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 683.77 Tc (MIN.) = 23.65EFFECTIVE AREA(ACRES) = 446.73 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21146.00 TO NODE 21165.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1403.00 DOWNSTREAM(FEET) = 1393.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 424.11 CHANNEL SLOPE = 0.0236

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 30

Date: 04/21/2014 File name: LR021177.RFS Page 29

```
MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 11.58 FLOW DEPTH (FEET) = 3.79
 TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 24.26
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
******************
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 10
_____
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
_____
FLOW PROCESS FROM NODE 21154.00 TO NODE 21154.20 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 709.46
 ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.117
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.637
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                 SCS Tc
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                   Fρ
                                           Αр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
                            8.73
                                           1.000
 "OPEN BRUSH"
                                                 66 17.34
                     В
                                    0.61
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                            0.90
                                    0.75
                                           0.600
                                                 56 10.12
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                            0.18
                                    0.75
                                           0.700
                                                56 10.76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958
 SUBAREA RUNOFF(CFS) = 26.84
                   9.81 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                                             26.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
******************
 FLOW PROCESS FROM NODE 21154.20 TO NODE 21154.40 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1620.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 614.72 CHANNEL SLOPE = 0.0976
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             26.84
 FLOW VELOCITY (FEET/SEC.) = 6.13 FLOW DEPTH (FEET) = 0.94
 TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 11.79
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21154.40 = 1324.18 FEET.
FLOW PROCESS FROM NODE 21154.40 TO NODE 21154.40 IS CODE = 81
```

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc(MIN.) = 11.79\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.319 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αp SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN NATURAL FAIR COVER 15.02 1.000 "OPEN BRUSH" В 0.61 66 RESIDENTIAL "2 DWELLINGS/ACRE" B 4.09 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" в 0.17 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933 SUBAREA AREA(ACRES) = 19.28 SUBAREA RUNOFF (CFS) = 47.29EFFECTIVE AREA(ACRES) = 29.09 AREA-AVERAGED Fm(INCH/HR) = 0.59 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94 TOTAL AREA (ACRES) = 29.1 PEAK FLOW RATE(CFS) = 71.32 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21154.40 TO NODE 21155.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 874.03 CHANNEL SLOPE = 0.0458 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00 CHANNEL FLOW THRU SUBAREA(CFS) = 71.32 FLOW VELOCITY (FEET/SEC.) = 5.91 FLOW DEPTH (FEET) = 1.55 TRAVEL TIME (MIN.) = 2.46 Tc (MIN.) = 14.25LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21155.00 = 2198.21 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21155.00 TO NODE 21155.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 14.25\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.961 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αр LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN NATURAL FAIR COVER "OPEN BRUSH" В 17.09 0.61 1.000 66 RESIDENTIAL "2 DWELLINGS/ACRE" 4.24 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 0.47 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933 SUBAREA AREA(ACRES) = 21.80 SUBAREA RUNOFF (CFS) = 46.47

File name: LR0211ZZ.RES

Page 32

Date: 04/21/2014

Date: 04/21/2014 File name: LR0211ZZ.RES Page 31

```
EFFECTIVE AREA(ACRES) = 50.89 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94
 TOTAL AREA (ACRES) = 50.9 PEAK FLOW RATE (CFS) = 108.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.78; 24HR = 3.39
*****************
 FLOW PROCESS FROM NODE 21155.00 TO NODE 21156.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1545.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1194.85 CHANNEL SLOPE = 0.0293
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             108.43
 FLOW VELOCITY (FEET/SEC.) = 5.54 FLOW DEPTH (FEET) = 1.98
 TRAVEL TIME (MIN.) = 3.60 Tc (MIN.) = 17.85
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21156.00 = 3393.06 FEET.
*******************
 FLOW PROCESS FROM NODE 21156.00 TO NODE 21156.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 17.85
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.587
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.30
                                     0.75
                                            0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    в 39.32
                                     0.75
                                            0.700
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                            7.87
                                     0.61
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738
 SUBAREA AREA (ACRES) = 51.49 SUBAREA RUNOFF (CFS) = 95.28
 EFFECTIVE AREA(ACRES) = 102.38 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 102.4 PEAK FLOW RATE (CFS) = 186.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 21156.00 TO NODE 21157.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1545.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
 STREET LENGTH (FEET) = 796.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     200.47
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.75
 HALFSTREET FLOOD WIDTH (FEET) = 30.71
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.23
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.72
STREET FLOW TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 19.15
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.481
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                           SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 10.24 0.75 0.600
                                                           56
RESIDENTIAL
"2 DWELLINGS/ACRE" B 5.14 0.75 0.700
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633
SUBAREA AREA (ACRES) = 15.38 SUBAREA RUNOFF (CFS) = 27.78
EFFECTIVE AREA(ACRES) = 117.76 AREA-AVERAGED Fm(INCH/HR) = 0.55
AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.81
TOTAL AREA (ACRES) = 117.8 PEAK FLOW RATE (CFS) =
                                                           204.53
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.95
FLOW VELOCITY (FEET/SEC.) = 10.28 DEPTH*VELOCITY (FT*FT/SEC.) = 7.80
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 41.07
PIPE-FLOW(CFS) = 129.15
PIPEFLOW TRAVEL TIME (MIN.) = 0.32 Tc (MIN.) = 18.17
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.560
SUBAREA AREA(ACRES) = 15.38 SUBAREA RUNOFF(CFS) = 28.87
TOTAL AREA (ACRES) = 117.8 PEAK FLOW RATE (CFS) = 212.90
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 83.75
 ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 34

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

Date: 04/21/2014 File name: LR0211ZZ.RES Page 33

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.98
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.06
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.67
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21157.00 = 4189.56 FEET.
******************
 FLOW PROCESS FROM NODE 21157.00 TO NODE 21163.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1500.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1452.00
 FLOW LENGTH (FEET) = 1406.44 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 32.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.47
 PIPE-FLOW(CFS) =
                    212.90
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 19.24
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.473
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                          SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.67 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 19.67
                                SUBAREA RUNOFF (CFS) = 35.84
 EFFECTIVE AREA(ACRES) = 137.43 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) =
                                                           239.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 26.69
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.63
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.12
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
```

```
FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.24
 RAINFALL INTENSITY (INCH/HR) = 2.47
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.78
 EFFECTIVE STREAM AREA(ACRES) = 137.43
 TOTAL STREAM AREA(ACRES) = 137.43
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 239.59
******************
 FLOW PROCESS FROM NODE 21160.00 TO NODE 21161.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 381.26
 ELEVATION DATA: UPSTREAM(FEET) = 1545.00 DOWNSTREAM(FEET) = 1522.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.785
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.256
 SUBAREA To AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                            αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.01 0.75 0.600 56 7.79
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 17.17
 TOTAL AREA (ACRES) = 5.01 PEAK FLOW RATE (CFS) = 17.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21161.00 TO NODE 21162.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1522.00 DOWNSTREAM(FEET) = 1500.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 409.32 CHANNEL SLOPE = 0.0537
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            17.17
 FLOW VELOCITY (FEET/SEC.) = 5.80 FLOW DEPTH (FEET) = 0.58
 TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 8.96
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21162.00 = 790.58 FEET.
******************
 FLOW PROCESS FROM NODE 21162.00 TO NODE 21162.00 IS CODE = 81
```

File name: LR0211ZZ.RES

Page 36

Date: 04/21/2014

Date: 04/21/2014 File name: LR0211ZZ.RES Page 35

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 8.96
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.912
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                        Ap
                                                 SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          4.71 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 4.71
                           SUBAREA RUNOFF (CFS) = 14.68
 EFFECTIVE AREA(ACRES) = 9.72 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 9.7 PEAK FLOW RATE (CFS) =
                                                 30.29
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 21162.00 TO NODE 21163.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1452.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1513.07 CHANNEL SLOPE = 0.0317
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            30.29
 FLOW VELOCITY (FEET/SEC.) = 5.71 FLOW DEPTH (FEET) = 0.91
 TRAVEL TIME (MIN.) = 4.41 Tc (MIN.) = 13.38
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21163.00 = 2303.65 FEET.
*******************
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 13.38
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.076
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.70 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 14.70 SUBAREA RUNOFF(CFS) = 34.76
 EFFECTIVE AREA(ACRES) = 24.42 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 24.4 PEAK FLOW RATE (CFS) =
                                                 57.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.38
 RAINFALL INTENSITY (INCH/HR) = 3.08
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 24.42
 TOTAL STREAM AREA(ACRES) = 24.42
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 57.74
 ** CONFLUENCE DATA **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
          239.59 19.24 2.473 0.69(0.54)0.78 137.4 21154.00
          57.74 13.38 3.076 0.75(0.45) 0.60 24.4 21160.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM
         0
                Tc Intensity Fp(Fm)
                                        Ap Ae
                                                     HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
  1
          276.15 13.38 3.076 0.70(0.52) 0.74 120.0 21160.00
          284.09 19.24 2.473 0.69(0.52) 0.75
                                              161.8 21154.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 284.09 Tc (MIN.) = 19.24
 EFFECTIVE AREA(ACRES) = 161.85 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.75
 TOTAL AREA(ACRES) = 161.8
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
******************
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21164.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1452.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1436.00
 FLOW LENGTH (FEET) = 667.61 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.63
 PIPE-FLOW(CFS) = 280.71
 PIPEFLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 19.87
 *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 29.6 INCHES
```

FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1

Date: 04/21/2014

```
PIPE-FLOW VELOCITY(FEET/SEC.) = 42.02
 PIPE-FLOW(CFS) =
                  284.09
 PIPEFLOW TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 19.51
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0050):
 PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21164.00 = 6263.61 FEET.
********************
 FLOW PROCESS FROM NODE 21164.00 TO NODE 21164.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 19.51
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.453
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.33
                                       0.75
                                              0.600
                                                    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      В
                            1.74
                                       0.63 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
 SUBAREA AREA(ACRES) = 15.07
                             SUBAREA RUNOFF (CFS) = 26.90
 EFFECTIVE AREA(ACRES) = 176.92 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 176.9 PEAK FLOW RATE (CFS) = 308.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm)
                                       Ар Ае
                                                     HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          307.20 13.64 3.041 0.70(0.51)0.73 135.0 21160.00
    2
          308.12 19.50 2.454 0.70(0.52) 0.74
                                              176.9 21154.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 308.12 Tc (MIN.) = 19.50
 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.74 EFFECTIVE AREA(ACRES) = 176.92
*********************
 FLOW PROCESS FROM NODE 21164.00 TO NODE 21165.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1436.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1393.00
 FLOW LENGTH (FEET) = 1236.24 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 37.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 25.84
 PIPE-FLOW(CFS) = 308.12
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 20.30
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 20.30\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.395 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE SCHOOL B 1.72 0.75 0.600 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 10.42 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA(ACRES) = 12.14 SUBAREA RUNOFF(CFS) = 21.27 EFFECTIVE AREA(ACRES) = 189.06 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.73TOTAL AREA (ACRES) = 189.1 PEAK FLOW RATE (CFS) = 320.11 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Аe HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 321.09 14.49 2.932 0.70(0.51) 0.72 147.2 21160.00 319.42 20.35 2.391 0.70(0.51) 0.73 189.1 21154.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 321.09 Tc (MIN.) = 14.49 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.72 EFFECTIVE AREA(ACRES) = 147.17\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY \*\* MAIN STREAM CONFLUENCE DATA \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 321.09 14.49 2.932 0.70(0.51)0.72 147.2 21160.00 1 319.42 20.35 2.391 0.70(0.51) 0.73 189.1 21154.00 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21165.00 = 7499.85 FEET. \*\* MEMORY BANK # 2 CONFLUENCE DATA \*\* Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 662.88 19.66 2.441 0.75(0.49) 0.65 366.9 21140.00 1 683.77 24.26 2.152 0.75(0.49) 0.66 446.7 21100.00 668.09 25.81 2.073 0.75 ( 0.49) 0.66 458.6 21150.00 643.22 27.38 2.001 0.75(0.49) 0.66 463.1 21121.00 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET. \*\* PEAK FLOW RATE TABLE \*\*

LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21165.00 = 7499.85 FEET.

Date: 04/21/2014 File name: LR0211ZZ.RES Page 39

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 40

```
Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                             USER SPECIFIED PIPE DIAMETER (INCH) = 85.00 NUMBER OF PIPES = 1
  STREAM
            0
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                              (ACRES) NODE
                                                                              DEPTH OF FLOW IN 85.0 INCH PIPE IS 58.6 INCHES
    1
          932.33 14.49 2.932 0.73(0.49) 0.68
                                              417.6 21160.00
                                                                             PIPE-FLOW VELOCITY(FEET/SEC.) = 34.03
    2
          982.50 19.66 2.441 0.73(0.50) 0.68
                                              551.1 21140.00
                                                                             PIPE-FLOW(CFS) = 985.44
          985.44 20.35
                       2.391 0.73 ( 0.50) 0.68
                                               568.0 21154.00
                                                                              *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
    3
          962.46 24.26 2.152 0.73 (0.50) 0.68
                                               635.8 21100.00
                                                                             PIPEFLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 24.80
          933.45 25.81
                       2.073 0.73 ( 0.50 ) 0.68
                                               647.7 21150.00
                                                                             LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
          896.30 27.38 2.001 0.73(0.50) 0.68
                                                652.1 21121.00
                                                                            ******************
                        652.1
   TOTAL AREA(ACRES) =
                                                                             FLOW PROCESS FROM NODE 21166.00 TO NODE 21166.00 IS CODE = 81
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =
                     985.44 Tc(MIN.) = 20.354
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 EFFECTIVE AREA(ACRES) = 568.01 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.68
                                                                             MAINLINE Tc(MIN.) = 24.80
 TOTAL AREA (ACRES) =
                   652.1
                                                                             * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.124
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
                                                                             SUBAREA LOSS RATE DATA (AMC II):
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fp
                                                                                                                           Αр
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 71
                                                                              RESIDENTIAL
                                                                                                В
                                                                              "3-4 DWELLINGS/ACRE"
                                                                                                         28.30
                                                                                                                   0.75
                                                                                                                           0.600
                                                                                                                                  56
______
                                                                                                   В
                                                                                                         18.42
                                                                                                                   0.75 0.600
                                                                                                                                  56
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
                                                                             SCHOOL
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                             SUBAREA AREA(ACRES) = 46.72
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.88;1H= 1.16;3H= 1.87;6H= 2.53;24H= 5.01
                                                                             UNIT-HYDROGRAPH DATA:
 S-GRAPH: VALLEY(DEV.) = 91.4%; VALLEY(UNDEV.)/DESERT= 8.6%
                                                                             RAINFALL(INCH): 5M= 0.43;30M= 0.88;1H= 1.16;3H= 1.88;6H= 2.55;24H= 5.04
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             S-GRAPH: VALLEY(DEV.) = 92.0%; VALLEY(UNDEV.)/DESERT= 8.0%
 Tc(HR) = 0.40; LAG(HR) = 0.32; Fm(INCH/HR) = 0.50; Ybar = 0.54
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             Tc(HR) = 0.41; LAG(HR) = 0.33; Fm(INCH/HR) = 0.49; Ybar = 0.54
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                              USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                              DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 652.1
                                                                              3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
                                                                              UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 698.8
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                             LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
  Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273; Lca/L=0.6,n=.0255
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 147.25
                                                                              Lca/L=0.3, n=.0315; Lca/L=0.4, n=.0283; Lca/L=0.5, n=.0260; Lca/L=0.6, n=.0242
                                                                              TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 158.07
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 919.45
 TOTAL PEAK FLOW RATE (CFS) = 919.45 (SOURCE FLOW INCLUDED)
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 981.26
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 985.44
                                                                              TOTAL AREA (ACRES) = 698.8
                                                                                                            PEAK FLOW RATE(CFS) =
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 985.44)
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 PEAK FLOW RATE (CFS) USED = 985.44
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
*******************
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 12
                                                                            ******************
 >>>>CLEAR MEMORY BANK # 2 <<<<
                                                                              FLOW PROCESS FROM NODE 21166.00 TO NODE 21167.00 IS CODE = 42
_____
                                                                            _______
                                                                             >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21166.00 IS CODE = 42
                                                                            _____
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1357.00
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                             DOWNSTREAM NODE ELEVATION (FEET) = 1320.00
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                              FLOW LENGTH (FEET) = 1316.79 MANNING'S N = 0.013
______
 UPSTREAM NODE ELEVATION (FEET) = 1393.00
                                                                             USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DOWNSTREAM NODE ELEVATION (FEET) = 1357.00
                                                                             DEPTH OF FLOW IN 84.0 INCH PIPE IS 63.5 INCHES
 FLOW LENGTH (FEET) = 1083.24 MANNING'S N = 0.013
                                                                             PIPE-FLOW VELOCITY (FEET/SEC.) = 31.57
                                                                             PIPE-FLOW(CFS) = 985.44
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 41 Date: 04/21/2014 File name: LR0211ZZ.RES Page 42

```
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 25.49
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
*************************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 25.49
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.089
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 42.55 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 42.55
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.89;1H= 1.17;3H= 1.89;6H= 2.56;24H= 5.07
 S-GRAPH: VALLEY (DEV.) = 92.4%; VALLEY (UNDEV.) / DESERT= 7.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.42; LAG(HR) = 0.34; Fm(INCH/HR) = 0.49; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 741.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0299; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246; Lca/L=0.6,n=.0229
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 168.25
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1031.19
 TOTAL AREA (ACRES) = 741.4 PEAK FLOW RATE (CFS) = 1031.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
***************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21167.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 741.4 TC (MIN.) =
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.53
 PEAK FLOW RATE (CFS) = 1031.19
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 43 Date: 04/21/2014 File name: LR0211ZZ.RES Page 44

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21248

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0212ZZ.DAT

12

14

1.5

16

24.0

39.0

36.0

12.5

13 32.0

15.0

20.0

20.0

20.0

5.0

TIME/DATE OF STUDY: 14:16 02/28/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2490

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 9 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020 0.50

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21200.00 TO NODE 21201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 569.96 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1707.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.219 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.843 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE SCHOOL 0.54 0.75 0.600 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 RESIDENTIAL 4.38 0.75 0.700 "2 DWELLINGS/ACRE" В SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673 SUBAREA RUNOFF (CFS) = 18.09 6.02 PEAK FLOW RATE (CFS) = TOTAL AREA (ACRES) = 18.09 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21201.00 TO NODE 21202.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1707.00 DOWNSTREAM ELEVATION(FEET) = 1695.00 STREET LENGTH (FEET) = 243.63 CURB HEIGHT (INCHES) = 8.0

File name: LR0212ZZ.RES

Date: 04/21/2014

17 20.0

18 26.0

19 52.0

10.0

15.0

20.0

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.20 FEET

0.020/0.020/0.020 0.50

0.020/0.020/0.020 0.67

as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

0.67

0.020/0.020/0.020

2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S)

1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

SCS Tc

56

56

Page 2

9.22

9.22

9.80

Date: 04/21/2014 File name: LR0212ZZ.RES Page 1

0.67

0.67

0.67

0.67

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   37.89
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.46
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.84
 STREET FLOW TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 11.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.369
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.92 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.90 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA (ACRES) = 9.82 SUBAREA RUNOFF (CFS) = 25.21
 EFFECTIVE AREA(ACRES) = 18.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 18.7 PEAK FLOW RATE (CFS) = 48.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 19.94
 FLOW VELOCITY (FEET/SEC.) = 5.78 DEPTH*VELOCITY (FT*FT/SEC.) = 3.22
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21203.00 = 1295.94 FEET.
******************
 FLOW PROCESS FROM NODE 21203.00 TO NODE 21204.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1675.00 DOWNSTREAM ELEVATION(FEET) = 1638.00
 STREET LENGTH (FEET) = 756.35 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74
                                                     59.22
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 4

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0212ZZ.RES Page 3

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
HALFSTREET FLOOD WIDTH (FEET) = 20.93
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.48
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.74
 STREET FLOW TRAVEL TIME (MIN.) = 1.95 Tc (MIN.) = 13.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.067
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                  Аp
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                               7.90
                                          0.75
                                                  0.700 56
 "2 DWELLINGS/ACRE"
                       В
 RESIDENTIAL
                       в 1.70
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                  0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 9.60
                                SUBAREA RUNOFF (CFS) = 22.09
 EFFECTIVE AREA(ACRES) = 28.29 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) =
                     28.3
                                 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.69
 FLOW VELOCITY (FEET/SEC.) = 6.66 DEPTH*VELOCITY (FT*FT/SEC.) = 3.94
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21204.00 = 2052.29 FEET.
FLOW PROCESS FROM NODE 21204.00 TO NODE 21205.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1638.00 DOWNSTREAM ELEVATION(FEET) = 1633.00
 STREET LENGTH (FEET) = 323.24 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.99
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  73.61
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.72
  HALFSTREET FLOOD WIDTH (FEET) = 28.62
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.55
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.27
 STREET FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 14.61
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.915
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                                         SCS
```

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL "2 DWELLINGS/ACRE" B 6.52 0.75 0.700 56
RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.27 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684  SUBAREA AREA(ACRES) = 7.79 SUBAREA RUNOFF(CFS) = 16.85  EFFECTIVE AREA(ACRES) = 36.08 AREA-AVERAGED Fm(INCH/HR) = 0.51  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
TOTAL AREA (ACRES) = 36.1 PEAK FLOW RATE (CFS) = 78.17
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.73
**************************************
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
UPSTREAM ELEVATION(FEET) = 1633.00 DOWNSTREAM ELEVATION(FEET) = 1629.00 STREET LENGTH(FEET) = 199.37 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 26.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.92
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 83.83 ***STREET FLOWING FULL***
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH (FEET) = 0.72  HALFSTREET FLOOD WIDTH (FEET) = 28.62  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.19  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.73  STREET FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 15.25
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.841 SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.19 0.75 0.600 56 RESIDENTIAL
"2 DWELLINGS/ACRE" B 4.19 0.75 0.700 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678

Date: 04/21/2014

```
SUBAREA AREA (ACRES) = 5.38 SUBAREA RUNOFF (CFS) = 11.30
 EFFECTIVE AREA(ACRES) = 41.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                  DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.58
 TOTAL AREA (ACRES) = 41.5 PEAK FLOW RATE (CFS) = 87.07
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.24 DEPTH*VELOCITY (FT*FT/SEC.) = 4.36
                                                                                  LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21207.00 = 3182.62 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                *******************
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  FLOW PROCESS FROM NODE 21207.00 TO NODE 21208.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.73 HALFSTREET FLOOD WIDTH (FEET) = 28.93
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY(FEET/SEC.) = 5.27 DEPTH*VELOCITY(FT*FT/SEC.) = 3.82
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21206.00 = 2574.90 FEET.
                                                                                _____
                                                                                  UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
******************
                                                                                  STREET LENGTH (FEET) = 532.97 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 21206.00 TO NODE 21207.00 IS CODE = 63
                                                                                  STREET HALFWIDTH (FEET) = 26.00
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1629.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 607.72 CURB HEIGHT (INCHES) = 8.0
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH(FEET) = 0.70
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 27.46
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.79
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 18.18
   ***STREET FLOWING FULL***
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.556
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
   STREET FLOW DEPTH(FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.58
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.23
                                                                                  RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.35
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                      B 6.92 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 16.88
                                                                                  RESIDENTIAL
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.674
                                                                                  "3-4 DWELLINGS/ACRE" B 1.09 0.75 0.600 56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 αA
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
                                                                                  SUBAREA AREA (ACRES) = 8.01 SUBAREA RUNOFF (CFS) = 14.73
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  EFFECTIVE AREA(ACRES) = 55.99 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                              5.03
                                         0.75
                                                 0.700 56
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                  TOTAL AREA(ACRES) = 56.0 PEAK FLOW RATE(CFS) = 103.20
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.49
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA (ACRES) = 6.52 SUBAREA RUNOFF (CFS) = 12.72
 EFFECTIVE AREA(ACRES) = 47.98 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                  DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.64
 TOTAL AREA (ACRES) = 48.0 PEAK FLOW RATE (CFS) = 93.53
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.85 DEPTH*VELOCITY (FT*FT/SEC.) = 4.79
                                                                                  LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21208.00 = 3715.59 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

Page 7

Date: 04/21/2014 File name: LR0212ZZ.RES

Date: 04/21/2014 File name: LR0212ZZ.RES Page 8

0.700

56

```
FLOWDEPTH IN BOX IS 1.54 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.92
 BOX-FLOW(CFS) = 104.51
 BOX-FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 20.55
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 20.55
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.375
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                          Ар
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                         5.58 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 5.58
                           SUBAREA RUNOFF (CFS) = 9.68
 EFFECTIVE AREA(ACRES) = 65.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 65.5
                            PEAK FLOW RATE(CFS) = 110.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
______
******************
 FLOW PROCESS FROM NODE 21213.30 TO NODE 21213.40 IS CODE = 21
.....
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 760.53
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.918
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.001
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                SCS SOIL AREA
                                Fр
                                         Ар
                                                SCS Tc
   LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 SCHOOL
                           8.73 0.75 0.600
                                                56 13.92
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.08 0.75 0.600
                                                56 13.92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 22.54
 TOTAL AREA(ACRES) = 9.81 PEAK FLOW RATE(CFS) = 22.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
```

Page 10

Date: 04/21/2014

```
*******************
 FLOW PROCESS FROM NODE 21213.40 TO NODE 21213.50 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1690.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 1952.61 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.35
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.82
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.54
 STREET FLOW TRAVEL TIME (MIN.) = 6.75 Tc (MIN.) = 20.66
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.368
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       Fр
                                                          SCS
                                                  Ар
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SCHOOL
                       B 3.65 0.75 0.600 56
```

RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.28 0.75 0.600 RESIDENTIAL "2 DWELLINGS/ACRE" В 12.18 0.75 0.700 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.661 SUBAREA AREA (ACRES) = 20.11 SUBAREA RUNOFF (CFS) = 33.91 EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64TOTAL AREA(ACRES) = 29.9 PEAK FLOW RATE(CFS) =

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.19 FLOW VELOCITY (FEET/SEC.) = 5.24 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.95 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 1952.6 FT WITH ELEVATION-DROP = 50.0 FT, IS 38.0 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21213.50 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21213.50 = 2713.14 FEET.

FLOW PROCESS FROM NODE 21213.50 TO NODE 21214.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1540.00 STREET LENGTH (FEET) = 2138.50 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.24 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.55HALFSTREET FLOOD WIDTH (FEET) = 20.45 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.84 PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 3.76 STREET FLOW TRAVEL TIME (MIN.) = 5.21 Tc (MIN.) = 25.88 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.069 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "2 DWELLINGS/ACRE" B 14.39 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.85 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689 SUBAREA AREA (ACRES) = 16.24 SUBAREA RUNOFF (CFS) = 22.71 EFFECTIVE AREA(ACRES) = 46.16 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66TOTAL AREA(ACRES) = 46.2 PEAK FLOW RATE(CFS) = 65.51 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.82 FLOW VELOCITY (FEET/SEC.) = 6.97 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.88 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 10 \_\_\_\_\_\_ >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< \_\_\_\_\_\_ FLOW PROCESS FROM NODE 21210.00 TO NODE 21211.00 IS CODE = 21

Date: 04/21/2014 Date: 04/21/2014 File name: LR0212ZZ.RES Page 11 File name: LR0212ZZ.RES Page 12

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 788.20
 ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.838
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.307
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                              Ap SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                             4.70
                                             0.700
                                                   56 12.59
                                      0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 0.64
                                      0.75
                                             0.600
                                                   56 11.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA RUNOFF (CFS) = 13.42
 TOTAL AREA(ACRES) = 5.34 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*****************
 FLOW PROCESS FROM NODE 21211.00 TO NODE 21212.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1610.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 337.81 CHANNEL SLOPE = 0.0444
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              13.42
 FLOW VELOCITY (FEET/SEC.) = 3.84 FLOW DEPTH (FEET) = 0.84
 TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 13.31
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21212.00 = 1126.01 FEET.
*********************
 FLOW PROCESS FROM NODE 21212.00 TO NODE 21212.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.31
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.083
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                             Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             7.68
                                      0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 7.68
                             SUBAREA RUNOFF (CFS) = 17.69
 EFFECTIVE AREA(ACRES) = 13.02 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 13.0
                             PEAK FLOW RATE (CFS) = 30.04
```

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21212.00 TO NODE 21213.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1592.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 463.88 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            30.04
 FLOW VELOCITY (FEET/SEC.) = 3.79 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 15.34
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21213.00 = 1589.89 FEET.
*******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 15.34
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.831
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                                            Αp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 5.46
                                    0.75
                                         0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.60 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 6.06 SUBAREA RUNOFF (CFS) = 12.62
 EFFECTIVE AREA(ACRES) = 19.08 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 19.1 PEAK FLOW RATE (CFS) = 39.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.01; 30M = 0.02; 1HR = 0.03; 3HR = 0.04; 6HR = 0.05; 24HR = 0.07
*******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.34
 RAINFALL INTENSITY (INCH/HR) = 2.83
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 19.08
 TOTAL STREAM AREA(ACRES) = 19.08
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                39.70
```

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014 File name: LR0212ZZ.RES Page 13 Date: 04/21/2014 File name: LR0212ZZ.RES Page 14

```
LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21213.10 TO NODE 21213.20 IS CODE = 21
                                                                            PUBLIC PARK
                                                                                                        0.14
                                                                                                                 0.75
______
                                                                            RESIDENTIAL
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                            "2 DWELLINGS/ACRE"
                                                                                                B
                                                                                                       4.29 0.75 0.700
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 686.22
                                                                            SUBAREA AREA(ACRES) = 4.43 SUBAREA RUNOFF(CFS) = 9.21
                                                                            EFFECTIVE AREA(ACRES) = 8.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
 ELEVATION DATA: UPSTREAM(FEET) = 1642.00 DOWNSTREAM(FEET) = 1610.00
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                            TOTAL AREA (ACRES) = 8.0 PEAK FLOW RATE (CFS) =
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.369
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.581
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                            5M = 0.31: 30M = 0.64: 1HR = 0.85: 3HR = 1.39: 6HR = 1.90: 24HR = 3.54
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                            END OF SUBAREA STREET FLOW HYDRAULICS:
                                     0.75
                                             0.850
                                                    56 12.16
                                                                            DEPTH (FEET) = 0.43 HALFSTREET FLOOD WIDTH (FEET) = 15.38
 PUBLIC PARK
                     В
                             1.60
 RESIDENTIAL
                                                                            FLOW VELOCITY (FEET/SEC.) = 3.33 DEPTH*VELOCITY (FT*FT/SEC.) = 1.45
 "2 DWELLINGS/ACRE"
                     в 1.75
                                      0.75
                                             0.700
                                                    56 11.02
                                                                            LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
 RESIDENTIAL
                                                                          ******************
 "3-4 DWELLINGS/ACRE" B 0.25 0.75
                                             0.600 56 10.37
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760
                                                                          _______
 SUBAREA RUNOFF(CFS) =
                     9.76
                                                                            >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 TOTAL AREA (ACRES) = 3.60 PEAK FLOW RATE (CFS) =
                                              9.76
                                                                            >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            TOTAL NUMBER OF STREAMS = 2
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
                                                                            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                            TIME OF CONCENTRATION (MIN.) = 15.29
******************
                                                                            RAINFALL INTENSITY (INCH/HR) = 2.84
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 63
                                                                            AREA-AVERAGED Fm(INCH/HR) = 0.55
_____
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                            AREA-AVERAGED Ap = 0.73
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                            EFFECTIVE STREAM AREA(ACRES) = 8.03
______
                                                                            TOTAL STREAM AREA(ACRES) = 8.03
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1592.00
                                                                            PEAK FLOW RATE (CFS) AT CONFLUENCE = 16.56
 STREET LENGTH (FEET) = 944.44 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                            ** CONFLUENCE DATA **
                                                                                    Q Tc Intensity Fp(Fm)
                                                                                                                   Ap Ae
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                             NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR)
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                             1
                                                                                      39.70 15.34 2.831 0.75(0.52) 0.69 19.1 21210.00
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     16.56 15.29 2.836 0.75(0.55) 0.73 8.0 21213.10
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                            RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                            CONFLUENCE FORMULA USED FOR 2 STREAMS.
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                            ** PEAK FLOW RATE TABLE **
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                             STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                            NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                      56.22 15.29 2.836 0.75(0.53) 0.70 27.0 21213.10
                                                                             1
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              2
                                                                                      56.22 15.34 2.831 0.75(0.53) 0.70 27.1 21210.00
   STREET FLOW DEPTH (FEET) = 0.42
                                                                            COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  HALFSTREET FLOOD WIDTH (FEET) = 14.60
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.20
                                                                            PEAK FLOW RATE (CFS) = 56.22 Tc (MIN.) = 15.29
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.34
                                                                            EFFECTIVE AREA(ACRES) = 27.05 AREA-AVERAGED Fm(INCH/HR) = 0.53
 STREET FLOW TRAVEL TIME (MIN.) = 4.92 Tc (MIN.) = 15.29
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.836
                                                                            TOTAL AREA (ACRES) = 27.1
 SUBAREA LOSS RATE DATA(AMC II):
                                                                            LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
```

Page 15

Date: 04/21/2014 File name: LR0212ZZ.RES

0.850

56

16.56

HEADWATER

(ACRES) NODE

```
******************
                                                                         ** PEAK FLOW RATE TABLE **
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21214.00 IS CODE = 54
                                                                          STREAM
                                                                                Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                         HEADWATER
______
                                                                          NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          1 120.36 16.89 2.672 0.75(0.51) 0.68 61.8 21213.10
                                                                                 120.39 16.94 2.667 0.75(0.51) 0.68 62.0 21210.00
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
3 109.63 25.88 2.069 0.75(0.51) 0.68 77.9 21213.30
 ELEVATION DATA: UPSTREAM(FEET) = 1592.00 DOWNSTREAM(FEET) = 1540.00
                                                                          TOTAL AREA(ACRES) =
                                                                                             77.9
 CHANNEL LENGTH THRU SUBAREA (FEET) = 580.67 CHANNEL SLOPE = 0.0896
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
                                                                         COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         PEAK FLOW RATE (CFS) = 120.39 Tc (MIN.) = 16.944
                                                                         EFFECTIVE AREA(ACRES) = 61.98 AREA-AVERAGED Fm(INCH/HR) = 0.51
 CHANNEL FLOW THRU SUBAREA(CFS) = 56.22
 FLOW VELOCITY (FEET/SEC.) = 6.05 FLOW DEPTH (FEET) = 0.96
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 16.89
                                                                         TOTAL AREA (ACRES) = 77.9
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
                                                                         LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
                                                                       ******************
********************
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 81
                                                                         FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 12
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         >>>>CLEAR MEMORY BANK # 1 <<<<
_____
                                                                       _____
 MAINLINE Tc(MIN.) = 16.89
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.672
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 21214.00 TO NODE 21215.00 IS CODE = 63
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Дp
                                                  SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>>> (STREET TABLE SECTION # 5 USED) <<<<
 "2 DWELLINGS/ACRE" B 4.04
                                           0.700
                                    0.75
                                                                       ______
 RESIDENTIAL
                                                                         UPSTREAM ELEVATION(FEET) = 1540.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 "3-4 DWELLINGS/ACRE" B 0.60
                                    0.75 0.600 56
                                                                         STREET LENGTH (FEET) = 601.35 CURB HEIGHT (INCHES) = 6.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA(ACRES) = 4.64
                            SUBAREA RUNOFF (CFS) = 9.01
                                                                         DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 EFFECTIVE AREA(ACRES) = 31.69 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                         INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
                                                                         OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                   61.23
 TOTAL AREA (ACRES) = 31.8 PEAK FLOW RATE (CFS) =
                                                                         SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
                                                                         Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                         Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
*********************
                                                                         MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 11
                                                                          **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                     129.12
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                          ***STREET FLOWING FULL***
_____
                                                                          STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                          STREET FLOW DEPTH (FEET) = 0.71
                                                                          HALFSTREET FLOOD WIDTH (FEET) = 28.69
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.51
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                          PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.36
   1
          61.23 16.89 2.672 0.75(0.52) 0.70 31.7 21213.10
                                                                         STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 18.28
          61.22 16.94 2.667 0.75(0.52)0.70 31.8 21210.00
                                                                         * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.549
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
                                                                         SUBAREA LOSS RATE DATA (AMC II):
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                         Fρ
                                                                                                                          SCS
                                                                                                                   αA
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                            LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                         RESIDENTIAL
                                                                         "3-4 DWELLINGS/ACRE" B 0.90 0.75 0.600
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                                                          56
   1
          65.51 25.88 2.069 0.75(0.49) 0.66 46.2 21213.30
                                                                         RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
                                                                         "2 DWELLINGS/ACRE" B 8.64 0.75 0.700
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 17 Date: 04/21/2014 File name: LR0212ZZ.RES Page 18

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
                                                                                   136.96 17.21 2.642 0.75(0.51) 0.68 71.4 21213.10
 SUBAREA AREA (ACRES) = 9.54 SUBAREA RUNOFF (CFS) = 17.45
                                                                                   136.95 17.26 2.638 0.75(0.51) 0.68 71.5 21210.00
 EFFECTIVE AREA(ACRES) = 71.52 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                   121.77 26.19 2.054 0.75(0.51) 0.68 87.5 21213.30
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                           LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
 TOTAL AREA (ACRES) = 87.5 PEAK FLOW RATE (CFS) = 131.22
                                                                           ** MEMORY BANK # 2 CONFLUENCE DATA **
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           STREAM
                                                                                   0
                                                                                         Tc Intensity Fp(Fm) Ap Ae
                                                                                                                             HEADWATER
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            1
                                                                                   110.44 20.55 2.375 0.75(0.50) 0.67 65.5 21200.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                           LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.88
 FLOW VELOCITY (FEET/SEC.) = 7.54 DEPTH*VELOCITY (FT*FT/SEC.) = 5.41
                                                                           ** PEAK FLOW RATE TABLE **
                                                                           STREAM
                                                                                     Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                           NUMBER
                                                                                                                      (ACRES) NODE
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                             1
                                                                                   242.62 17.21 2.642 0.75(0.51) 0.68
                                                                                                                     126.2 21213.10
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                   242.70 17.26 2.638 0.75(0.51) 0.68 126.6 21210.00
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                   241.80 20.55 2.375 0.75(0.51) 0.68 142.9 21200.00
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
                                                                                   213.24 26.19 2.054 0.75(0.51) 0.68
                                                                                                                       153.0 21213.30
 ASSUME FULL-FLOWING PIPELINE
                                                                            TOTAL AREA(ACRES) = 153.0
 PIPE-FLOW VELOCITY(FEET/SEC.) = 31.51
 PIPE-FLOW(CFS) =
                  99.09
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PIPEFLOW TRAVEL TIME (MIN.) = 0.32 Tc (MIN.) = 17.26
                                                                           PEAK FLOW RATE (CFS) = 242.70 Tc (MIN.) = 17.262
                                                                           EFFECTIVE AREA(ACRES) = 126.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.638
 SUBAREA AREA (ACRES) = 9.54 SUBAREA RUNOFF (CFS) = 18.21
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 87.5 PEAK FLOW RATE(CFS) = 136.95
                                                                           TOTAL AREA(ACRES) = 153.0
                                                                           LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         ******************
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
                                                                           FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 12
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 37.87
  ***STREET FLOWING FULL***
                                                                          >>>>CLEAR MEMORY BANK # 2 <<<<
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                         ______
  STREET FLOW DEPTH(FEET) = 0.51
                                                                         ******************
  HALFSTREET FLOOD WIDTH (FEET) = 18.26
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.12
                                                                          FLOW PROCESS FROM NODE 21215.00 TO NODE 21216.00 IS CODE = 48
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.59
                                                                          ______
                                                                           >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 ** PEAK FLOW RATE TABLE **
                                                                          >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae
                                                   HEADWATER
                                                                         _____
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1520.00 DOWNSTREAM(FEET) = 1470.00
   1
         136.96 17.21 2.642 0.75(0.51) 0.68 71.4 21213.10
                                                                           FLOW LENGTH (FEET) = 1371.54 MANNING'S N = 0.014
         136.95 17.26 2.638 0.75(0.51) 0.68 71.5 21210.00
                                                                           GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                           FLOWDEPTH IN BOX IS 1.83 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 22.06
    3
         121.77 26.19 2.054 0.75(0.51) 0.68 87.5 21213.30
 NEW PEAK FLOW DATA ARE:
                                                                           BOX-FLOW(CFS) = 242.70
 PEAK FLOW RATE (CFS) = 136.96 Tc (MIN.) = 17.21
                                                                           BOX-FLOW TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 18.30
 AREA-AVERAGED Fm(INCH/HR) = 0.51 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                           LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21216.00 = 6824.53 FEET.
 AREA-AVERAGED Ap = 0.68 EFFECTIVE AREA(ACRES) = 71.36
                                                                         ******************
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                           FLOW PROCESS FROM NODE 21216.00 TO NODE 21216.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 11
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
._____
                                                                         _____
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY
                                                                           MAINLINE Tc (MIN.) = 18.30
_____
                                                                           * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.547
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 ** MAIN STREAM CONFLUENCE DATA **
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                   HEADWATER
                                                                             LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                           RESIDENTIAL
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 19

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 20

```
"3-4 DWELLINGS/ACRE"
                    B 23.70 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          ** PEAK FLOW RATE TABLE **
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                    0
                                                                                          Tc Intensity Fp(Fm) Ap Ae
                                                                                                                            HEADWATER
                             SUBAREA RUNOFF(CFS) = 44.75
 SUBAREA AREA(ACRES) = 23.70
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                     (ACRES) NODE
 EFFECTIVE AREA(ACRES) = 150.26 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                           1
                                                                                   291.77 19.05 2.486 0.75(0.49) 0.66 162.7 21213.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
                                                                            2
                                                                                   291.79 19.10 2.483 0.75(0.49) 0.66
                                                                                                                       163.0 21210.00
 TOTAL AREA (ACRES) = 176.7 PEAK FLOW RATE (CFS) = 277.12
                                                                                   285.92 22.24 2.265 0.75(0.49) 0.66
                                                                                                                       179.4 21200.00
                                                                                   253.19 27.86 1.979 0.75(0.49) 0.66
                                                                                                                       189.5 21213.30
                                                                          NEW PEAK FLOW DATA ARE:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                          PEAK FLOW RATE (CFS) = 291.77 Tc (MIN.) = 19.05
                                                                          AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.75
 ** PEAK FLOW RATE TABLE **
                                                                          AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) =
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         ******************
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
    1
          278.39 18.19 2.556 0.75 (0.50) 0.67
                                            150.3 21210.00
                                                                           FLOW PROCESS FROM NODE 21217.00 TO NODE 21236.00 IS CODE = 48
          277.78 18.19 2.556 0.75 (0.50) 0.67
                                            149.9 21213.10
                                                                         ______
          272.78 21.43 2.317 0.75(0.50) 0.67
                                             166.6 21200.00
                                                                          >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
          241.20 27.05 2.014 0.75(0.50) 0.67
                                             176.7 21213.30
                                                                          >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 NEW PEAK FLOW DATA ARE:
                                                                         _____
 PEAK FLOW RATE (CFS) = 277.78 Tc (MIN.) = 18.19
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1358.00
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                          FLOW LENGTH (FEET) = 1911.29 MANNING'S N = 0.014
 AREA-AVERAGED Ap = 0.67 EFFECTIVE AREA(ACRES) = 149.94
                                                                          GIVEN BOX BASEWIDTH(FEET) = 8.00 GIVEN BOX HEIGHT(FEET) = 3.00
                                                                          FLOWDEPTH IN BOX IS 1.74 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 20.91
*******************
                                                                          BOX-FLOW(CFS) = 291.79
 FLOW PROCESS FROM NODE 21216.00 TO NODE 21217.00 IS CODE = 48
                                                                          BOX-FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 20.57
                                                                          LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                         ******************
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
                                                                          FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 81
 ELEVATION DATA: UPSTREAM(FEET) = 1470.00 DOWNSTREAM(FEET) = 1415.00
 FLOW LENGTH (FEET) = 1351.25 MANNING'S N = 0.014
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 GIVEN BOX BASEWIDTH (FEET) = 7.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                         ______
 FLOWDEPTH IN BOX IS 1.70 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 23.42
                                                                          MAINLINE Tc(MIN.) = 20.57
 BOX-FLOW(CFS) = 278.39
                                                                          * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.374
 BOX-FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 19.15
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21217.00 = 8175.78 FEET.
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                     αA
                                                                              LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE" B 19.73
 FLOW PROCESS FROM NODE 21217.00 TO NODE 21217.00 IS CODE = 81
                                                                                                              0.75 0.600
______
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                          SUBAREA AREA(ACRES) = 19.73 SUBAREA RUNOFF(CFS) = 34.19
 MAINLINE Tc(MIN.) = 19.15
                                                                          EFFECTIVE AREA(ACRES) = 182.44 AREA-AVERAGED Fm(INCH/HR) = 0.49
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.478
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
                                                                          TOTAL AREA(ACRES) = 209.2
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                       PEAK FLOW RATE (CFS) = 309.39
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.77 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          ** PEAK FLOW RATE TABLE **
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           STREAM
                                                                                    0
                                                                                           Tc Intensity Fp(Fm)
                                                                                                                    Аe
                                                                                                                            HEADWATER
 SUBAREA AREA(ACRES) = 12.77 SUBAREA RUNOFF(CFS) = 23.33
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                     (ACRES) NODE
 EFFECTIVE AREA(ACRES) = 162.71 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                           1
                                                                                   311.29 20.46 2.382 0.75(0.49) 0.65 182.8 21210.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
                                                                                   310.44 20.49 2.380 0.75(0.49) 0.65
                                                                                                                     182.4 21213.10
 TOTAL AREA(ACRES) = 189.5 PEAK FLOW RATE(CFS) = 290.46
                                                                                   304.56 23.55 2.189 0.75(0.49) 0.65
                                                                                                                       199.1 21200.00
                                                                                   270.42 29.15 1.926 0.75(0.49) 0.65
                                                                                                                       209.2 21213.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          NEW PEAK FLOW DATA ARE:
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                          PEAK FLOW RATE (CFS) = 310.44 Tc (MIN.) = 20.49
```

Date: 04/21/2014

File name: LR021277.RFS

Page 22

Date: 04/21/2014

File name: LR021277.RFS

Page 21

```
AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                           * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.954
 AREA-AVERAGED Ap = 0.65 EFFECTIVE AREA(ACRES) =
                                                                           SUBAREA LOSS RATE DATA (AMC II):
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                             SCS
******************
                                                                              LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 10
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE" B
                                                                                                     0.88
                                                                                                               0.75
                                                                                                                       0.600
                                                                                                                              56
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                           AGRICULTURAL FAIR COVER
                                                                                                    9.97
                                                                           "ORCHARDS"
______
                                                                                                               0.63
                                                                                                                       1.000
                                                                                                       3.94
                                                                           PUBLIC PARK
                                                                                                B
                                                                                                               0.75
                                                                                                                       0.850
                                                                                                                              56
*****
                                                                           RESIDENTIAL
                                                                                               B 2.50
                                                                                                               0.75 0.700
 FLOW PROCESS FROM NODE 21220.00 TO NODE 21221.00 IS CODE = 21
                                                                           "2 DWELLINGS/ACRE"
                                                                                                                              56
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                           SUBAREA AREA(ACRES) = 17.29
                                                                                                       SUBAREA RUNOFF (CFS) = 36.53
_____
                                                                           EFFECTIVE AREA(ACRES) = 26.27 AREA-AVERAGED Fm(INCH/HR) = 0.61
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.88
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 765.06
 ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
                                                                           TOTAL AREA (ACRES) = 26.3 PEAK FLOW RATE (CFS) =
                                                                                                                              55.38
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.585
                                                                           5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.537
                                                                          *******************
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                           Ap SCS Tc
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                                                                           FLOW PROCESS FROM NODE 21222.00 TO NODE 21223.00 IS CODE = 63
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 PUBLIC PARK
                     В
                             8.02
                                     0.75
                                             0.850
                                                   56 12.41
                                                                           >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                           >>>> (STREET TABLE SECTION # 5 USED) <<<<
 "2 DWELLINGS/ACRE" B
                             0.68
                                     0.75
                                             0.700
                                                   56 11.25
                                                                          ______
 RESIDENTIAL
                                                                           UPSTREAM ELEVATION(FEET) = 1515.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
 "3-4 DWELLINGS/ACRE" B
                           0.28
                                     0.75
                                           0.600 56 10.59
                                                                           STREET LENGTH (FEET) = 477.50 CURB HEIGHT (INCHES) = 6.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.831
 SUBAREA RUNOFF(CFS) =
                   23.56
                                                                           DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 TOTAL AREA (ACRES) =
                     8.98 PEAK FLOW RATE (CFS) = 23.56
                                                                           INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                           OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                           STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 FLOW PROCESS FROM NODE 21221.00 TO NODE 21222.00 IS CODE = 54
                                                                           Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
______
                                                                           MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                         67.62
______
                                                                            ***STREET FLOWING FULL***
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1515.00
                                                                            STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL LENGTH THRU SUBAREA (FEET) = 731.02 CHANNEL SLOPE = 0.0889
                                                                            STREET FLOW DEPTH (FEET) = 0.59
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                            HALFSTREET FLOOD WIDTH (FEET) = 22.65
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                            AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.15
 CHANNEL FLOW THRU SUBAREA(CFS) = 23.56
                                                                            PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.65
 FLOW VELOCITY (FEET/SEC.) = 3.29 FLOW DEPTH (FEET) = 0.38
                                                                           STREET FLOW TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 15.59
 TRAVEL TIME (MIN.) = 3.71 Tc (MIN.) = 14.29
                                                                           * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.804
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21222.00 = 1496.08 FEET.
                                                                           SUBAREA LOSS RATE DATA (AMC II):
                                                                           DEVELOPMENT TYPE/
                                                                                            SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                             SCS
                                                                                                                       Aρ
*****************
                                                                               LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21222.00 TO NODE 21222.00 IS CODE = 81
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                              B 11.55 0.75 0.600
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           SUBAREA AREA(ACRES) = 11.55 SUBAREA RUNOFF(CFS) = 24.49
 MAINLINE Tc(MIN.) = 14.29
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 23 Date: 04/21/2014 File name: LR0212ZZ.RES Page 24

```
EFFECTIVE AREA(ACRES) = 37.82 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 37.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.69
 FLOW VELOCITY (FEET/SEC.) = 6.38 DEPTH*VELOCITY (FT*FT/SEC.) = 3.92
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21223.00 = 1973.58 FEET.
*****
 FLOW PROCESS FROM NODE 21223.00 TO NODE 21224.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1500.00 DOWNSTREAM ELEVATION(FEET) = 1480.00
 STREET LENGTH (FEET) = 869.02 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 92.02
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.02
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.09
 STREET FLOW TRAVEL TIME (MIN.) = 2.41 Tc (MIN.) = 17.99
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.573
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Дp
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.47 0.75 0.600 56
 AGRICULTURAL FAIR COVER
                              8.69 0.63 1.000 65
  "ORCHARDS"
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803
 SUBAREA AREA (ACRES) = 17.16 SUBAREA RUNOFF (CFS) = 31.39
 EFFECTIVE AREA(ACRES) = 54.98 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 55.0 PEAK FLOW RATE (CFS) =
                                                          99.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

```
DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.90
 FLOW VELOCITY (FEET/SEC.) = 6.12 DEPTH*VELOCITY (FT*FT/SEC.) = 4.27
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 869.0 FT WITH ELEVATION-DROP = 20.0 FT, IS 39.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21224.00
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21224.00 = 2842.60 FEET.
******************
 FLOW PROCESS FROM NODE 21224.00 TO NODE 21225.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_______
 UPSTREAM ELEVATION(FEET) = 1480.00 DOWNSTREAM ELEVATION(FEET) = 1473.00
 STREET LENGTH (FEET) = 240.38 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.49
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 31.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.44
 STREET FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 18.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.518
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               qΑ
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.82 0.75 0.600
 AGRICULTURAL FAIR COVER
                              0.13 0.63 1.000
 "ORCHARDS"
              В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.613
 SUBAREA AREA (ACRES) = 3.95 SUBAREA RUNOFF (CFS) = 7.33
 EFFECTIVE AREA(ACRES) = 58.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 58.9 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 32.25
 FLOW VELOCITY (FEET/SEC.) = 6.06 DEPTH*VELOCITY (FT*FT/SEC.) = 4.45
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21225.00 = 3082.98 FEET.
```

File name: LR0212ZZ.RES

Page 26

END OF SUBAREA STREET FLOW HYDRAULICS:

Date: 04/21/2014

Date: 04/21/2014 File name: LR0212ZZ.RES Page 25

```
*******************
 FLOW PROCESS FROM NODE 21225.00 TO NODE 21233.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1473.00 DOWNSTREAM(FEET) = 1423.00
 FLOW LENGTH (FEET) = 1355.56 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 1.50
 FLOWDEPTH IN BOX IS 1.03 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.98
 BOX-FLOW(CFS) = 104.44
 BOX-FLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 19.98
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET.
******************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 19.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.416
 SUBAREA LOSS RATE DATA (AMC II):
                                Fp Ap SCS
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 16.86 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 16.86 SUBAREA RUNOFF(CFS) = 29.85
 EFFECTIVE AREA(ACRES) = 75.79 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 75.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*********************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.98
 RAINFALL INTENSITY (INCH/HR) = 2.42
 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.74
 EFFECTIVE STREAM AREA(ACRES) = 75.79
 TOTAL STREAM AREA(ACRES) = 75.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 128.88
******************
 FLOW PROCESS FROM NODE 21230.00 TO NODE 21231.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.64
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.802
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Aρ
                                                       SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.58 0.75 0.600 56 9.38
                        В
                              0.10 0.75 0.600 56 9.38
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 14.12
 TOTAL AREA(ACRES) = 4.68 PEAK FLOW RATE(CFS) = 14.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*************************
 FLOW PROCESS FROM NODE 21231.00 TO NODE 21232.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 739.29 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.90
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 15.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.99
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.84
 STREET FLOW TRAVEL TIME (MIN.) = 3.09 Tc (MIN.) = 12.47
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.205
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.65 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 4.65 SUBAREA RUNOFF (CFS) = 11.53
 EFFECTIVE AREA(ACRES) = 9.33 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
```

File name: LR0212ZZ.RES

Page 28

Date: 04/21/2014

Date: 04/21/2014 File name: LR0212ZZ.RES Page 27

```
TOTAL AREA (ACRES) = 9.3 PEAK FLOW RATE (CFS) = 23.14
                                                                            ******************
                                                                              FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            ______
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                              >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                              >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                            _____
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 16.19
                                                                              TOTAL NUMBER OF STREAMS = 2
 FLOW VELOCITY (FEET/SEC.) = 4.12 DEPTH*VELOCITY (FT*FT/SEC.) = 1.99
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21232.00 = 1307.93 FEET.
                                                                              TIME OF CONCENTRATION (MIN.) = 16.00
                                                                              RAINFALL INTENSITY (INCH/HR) = 2.76
******************
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.45
 FLOW PROCESS FROM NODE 21232.00 TO NODE 21233.00 IS CODE = 63
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                              AREA-AVERAGED Ap = 0.60
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              EFFECTIVE STREAM AREA(ACRES) = 18.88
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                              TOTAL STREAM AREA(ACRES) = 18.88
_____
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 39.27
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1423.00
 STREET LENGTH (FEET) = 666.66 CURB HEIGHT (INCHES) = 8.0
                                                                              ** CONFLUENCE DATA **
 STREET HALFWIDTH (FEET) = 32.00
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                              NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                               1 128.88 19.98 2.416 0.71(0.53) 0.74 75.8 21220.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                      39.27 16.00 2.760 0.75(0.45) 0.60 18.9 21230.00
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              CONFLUENCE FORMULA USED FOR 2 STREAMS.
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              ** PEAK FLOW RATE TABLE **
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                              NUMBER
                                                                                       161.30 16.00 2.760 0.72(0.51) 0.71 79.6 21230.00
                                                                               1
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               2 162.30 19.98 2.416 0.72(0.51) 0.71 94.7 21220.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
                                                                              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   HALFSTREET FLOOD WIDTH (FEET) = 22.51
                                                                              PEAK FLOW RATE (CFS) = 162.30 Tc (MIN.) = 19.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15
                                                                              EFFECTIVE AREA(ACRES) = 94.67 AREA-AVERAGED Fm(INCH/HR) = 0.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.71
 STREET FLOW TRAVEL TIME (MIN.) = 3.53 Tc (MIN.) = 16.00
                                                                                                94.7
                                                                              TOTAL AREA (ACRES) =
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.760
                                                                              LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET.
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                            *******************
                                   Fp
                                                     SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             FLOW PROCESS FROM NODE 21233.00 TO NODE 21234.00 IS CODE = 48
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.55 0.75 0.600 56
                                                                             >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.55 SUBAREA RUNOFF (CFS) = 19.87
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1423.00 DOWNSTREAM(FEET) = 1373.00
 EFFECTIVE AREA(ACRES) = 18.88 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                              FLOW LENGTH (FEET) = 1343.35 MANNING'S N = 0.014
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                              GIVEN BOX BASEWIDTH (FEET) = 8.00 GIVEN BOX HEIGHT (FEET) = 1.50
 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) =
                                                                              FLOWDEPTH IN BOX IS 1.10 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 18.51
                                                                              BOX-FLOW(CFS) = 162.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              BOX-FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 21.19
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                              LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21234.00 = 5781.89 FEET.
                                                                             *****************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.07
                                                                              FLOW PROCESS FROM NODE 21234.00 TO NODE 21234.00 IS CODE = 81
 FLOW VELOCITY (FEET/SEC.) = 3.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.10
 LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21233.00 = 1974.59 FEET.
                                                                              >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             _____
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 29 Date: 04/21/2014 File name: LR0212ZZ.RES Page 30

```
MAINLINE Tc(MIN.) = 21.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.332
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Ар
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 30.53 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 30.53 SUBAREA RUNOFF(CFS) = 51.75
 EFFECTIVE AREA(ACRES) = 125.20 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 125.2 PEAK FLOW RATE(CFS) =
                                                   206.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          213.66 17.15 2.648 0.72(0.49) 0.68 110.1 21230.00
    2
          207.82 21.07 2.340 0.72(0.50) 0.69 125.2 21220.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 213.66 Tc (MIN.) = 17.15
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.68 EFFECTIVE AREA(ACRES) = 110.11
******************
 FLOW PROCESS FROM NODE 21234.00 TO NODE 21235.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1373.00 DOWNSTREAM(FEET) = 1359.00
 FLOW LENGTH (FEET) = 833.47 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 15.00 GIVEN BOX HEIGHT(FEET) = 1.50
 FLOWDEPTH IN BOX IS 1.08 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 13.21
 BOX-FLOW(CFS) = 213.66
 BOX-FLOW TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 18.20
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21235.00 = 6615.36 FEET.
******************
 FLOW PROCESS FROM NODE 21235.00 TO NODE 21235.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 18.20
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.555
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                   Fρ
                                            αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                   В
                             8.16
                                      0.75
                                             0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            6.30
                                   0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
 SUBAREA AREA(ACRES) = 14.46 SUBAREA RUNOFF(CFS) = 29.33
 EFFECTIVE AREA(ACRES) = 124.57 AREA-AVERAGED Fm(INCH/HR) = 0.47
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) =
                  139.7 PEAK FLOW RATE (CFS) =
                                                 233.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 ** PEAK FLOW RATE TABLE **
  STREAM
         O Tc Intensity Fp(Fm)
                                       Ap Ae
                                                 HEADWATER
  NUMBER
                                           (ACRES) NODE
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
         234.28 18.15 2.559 0.73(0.47) 0.65 124.6 21230.00
  1
         226.60 22.03 2.278 0.72(0.48) 0.66 139.7 21220.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 234.28 Tc (MIN.) = 18.15
 AREA-AVERAGED Fm (INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.73
 AREA-AVERAGED Ap = 0.65 EFFECTIVE AREA(ACRES) = 124.57
******************
 FLOW PROCESS FROM NODE 21235.00 TO NODE 21236.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1359.00 DOWNSTREAM(FEET) = 1358.00
 FLOW LENGTH (FEET) = 230.02 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 31.00 GIVEN BOX HEIGHT (FEET) = 1.50
 FLOWDEPTH IN BOX IS 1.07 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 7.04
 BOX-FLOW(CFS) = 234.28
 BOX-FLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 18.70
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.
******************
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
  1
         234.28 18.67 2.516 0.73(0.47) 0.65 124.6 21230.00
         226.60 22.53 2.248 0.72(0.48) 0.66 139.7 21220.00
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
         0
               Tc Intensity Fp(Fm)
                                     Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
  1
          311.29 20.46 2.382 0.75(0.49) 0.65 182.8 21210.00
                      2.380 0.75(0.49) 0.65 182.4 21213.10
          310.44 20.49
                                            199.1 21200.00
          304.56 23.55
                      2.189 0.75(0.49) 0.65
          270.42 29.15 1.926 0.75(0.49) 0.65 209.2 21213.30
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
  1
         538.51 18.67 2.516 0.74(0.48) 0.65 291.3 21230.00
   2
         542.00 20.46 2.382 0.74(0.48) 0.65 314.3 21210.00
          541.10 20.49 2.380 0.74(0.48) 0.65 314.1 21213.10
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 32

Date: 04/21/2014 File name: LR0212ZZ.RES Page 31

4 533.12 22.53 2.248 0.74(0.48) 0.66 333.2 21220.00 5 523.66 23.55 2.189 0.74(0.48) 0.66 338.8 21200.00 6 455.88 29.15 1.926 0.74(0.48) 0.66 348.9 21213.30  TOTAL AREA(ACRES) = 348.9  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE(CFS) = 542.00 Tc(MIN.) = 20.464  EFFECTIVE AREA(ACRES) = 314.34 AREA-AVERAGED Fm(INCH/HR) = 0.48	STREAM         Q         Tc         Intensity         Fp(Fm)         Ap         Ae         HEADWATER           NUMBER         (CFS)         (MIN.)         (INCH/HR)         (INCH/HR)         (ACRES)         NODE           1         615.99         20.03         2.412         0.74 (0.45)         0.61         348.7         21230.00           2         617.37         21.70         2.299         0.74 (0.45)         0.61         371.5         21213.10           3         616.76         21.75         2.296         0.74 (0.45)         0.61         371.7         21210.00           4         606.87         23.68         2.182         0.74 (0.46)         0.62         390.6         21220.00           5         596.94         24.64         2.130         0.74 (0.46)         0.62         396.1         21200.00           6         521.90         30.23         1.885         0.74 (0.46)         0.62         406.2         21213.30
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.65  TOTAL AREA(ACRES) = 348.9  LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.	NEW PEAK FLOW DATA ARE:  PEAK FLOW RATE(CFS) = 616.76 Tc(MIN.) = 21.75  AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.74  AREA-AVERAGED Ap = 0.61 EFFECTIVE AREA(ACRES) = 371.70
FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 12	**************************************
>>>>CLEAR MEMORY BANK # 1 <<<<	>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
**************************************	TOTAL NUMBER OF STREAMS = 2  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:  TIME OF CONCENTRATION(MIN.) = 21.75  RAINFALL INTENSITY(INCH/HR) = 2.30  AREA-AVERAGED FM(INCH/HR) = 0.45
ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1311.00 FLOW LENGTH(FEET) = 1973.53 MANNING'S N = 0.014 GIVEN BOX BASEWIDTH(FEET) = 9.00 GIVEN BOX HEIGHT(FEET) = 4.00 FLOWDEPTH IN BOX IS 2.63 FEET BOX-FLOW VELOCITY(FEET/SEC.) = 22.92 BOX-FLOW(CFS) = 542.00 BOX-FLOW TRAVEL TIME(MIN.) = 1.44 Tc(MIN.) = 21.90 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21246.00 = 12060.60 FEET.	AREA-AVERAGED Fp(INCH/HR) = 0.74  AREA-AVERAGED Ap = 0.61  EFFECTIVE STREAM AREA(ACRES) = 371.70  TOTAL STREAM AREA(ACRES) = 406.21  PEAK FLOW RATE(CFS) AT CONFLUENCE = 617.37  **********************************
FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 81  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<	>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
MAINLINE TC (MIN.) = 21.90  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.287  SUBAREA LOSS RATE DATA (AMC II):	TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 10.728
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56	* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.509  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
COMMERCIAL B 3.79 0.75 0.100 56  MOBILE HOME PARK B 30.62 0.75 0.250 56  PUBLIC PARK B 2.31 0.75 0.850 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390  SUBAREA AREA(ACRES) = 57.36 SUBAREA RUNOFF(CFS) = 102.98  EFFECTIVE AREA(ACRES) = 371.70 AREA-AVERAGED Fm(INCH/HR) = 0.45  AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61	RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 6.78 0.75 0.600 56 10.73  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600  SUBAREA RUNOFF(CFS) = 18.67  TOTAL AREA (ACRES) = 6.78 PEAK FLOW RATE(CFS) = 18.67  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
TOTAL AREA (ACRES) = 406.2 PEAK FLOW RATE (CFS) = 613.51	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50	**************************************
** PEAK FLOW RATE TABLE **	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA

Date: 04/21/2014 File name: LR0212ZZ.RES Page 33 File name: LR0212ZZ.RES Page 34

Date: 04/21/2014

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.46
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                      58.46
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.60
 HALFSTREET FLOOD WIDTH (FEET) = 22.34
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.64
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.41
STREET FLOW TRAVEL TIME (MIN.) = 3.88 Tc (MIN.) = 18.93
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.496
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"
                      B 14.61 0.75 0.600
                                                           56
                       В
COMMERCIAL
                               0.19 0.75 0.100 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
SUBAREA AREA(ACRES) = 14.80 SUBAREA RUNOFF(CFS) = 27.33
EFFECTIVE AREA(ACRES) = 35.40 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
TOTAL AREA (ACRES) = 35.4 PEAK FLOW RATE (CFS) = 65.27
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 0.62 HALFSTREET FLOOD WIDTH (FEET) = 23.33
FLOW VELOCITY (FEET/SEC.) = 5.79 DEPTH*VELOCITY (FT*FT/SEC.) = 3.62
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.46
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 24.0 INCH PIPE IS 11.2 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 31.08
PIPE-FLOW(CFS) =
                   44.78
PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 15.75
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.786
SUBAREA AREA (ACRES) = 14.80 SUBAREA RUNOFF (CFS) = 31.20
TOTAL AREA (ACRES) = 35.4 PEAK FLOW RATE (CFS) = 74.54
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 29.76
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.50
 HALFSTREET FLOOD WIDTH (FEET) = 17.06
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.80
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.40
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
```

File name: LR0212ZZ.RES

Page 36

Date: 04/21/2014

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

Date: 04/21/2014 File name: LR0212ZZ.RES Page 35

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
AND L = 1314.5 FT WITH ELEVATION-DROP = 45.0 FT, IS 41.3 CFS,
        WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21243.00
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21243.00 = 3390.70 FEET.
*****************
 FLOW PROCESS FROM NODE 21243.00 TO NODE 21244.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1420.00 DOWNSTREAM ELEVATION(FEET) = 1372.00
 STREET LENGTH (FEET) = 1306.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 STREET FLOW TRAVEL TIME (MIN.) = 3.39 Tc (MIN.) = 19.14
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.479
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.60
                                        0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.60 SUBAREA RUNOFF (CFS) = 26.67
 EFFECTIVE AREA(ACRES) = 50.00 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 50.0 PEAK FLOW RATE (CFS) = 91.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.73
 FLOW VELOCITY (FEET/SEC.) = 6.50 DEPTH*VELOCITY (FT*FT/SEC.) = 4.43
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 15.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 36.04
 PIPE-FLOW(CFS) = 74.54
 PIPEFLOW TRAVEL TIME (MIN.) = 0.60 Tc (MIN.) = 16.36
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.724
 SUBAREA AREA(ACRES) = 14.60 SUBAREA RUNOFF(CFS) = 29.90
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 27.92
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 16.36
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.87
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.36
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21244.00 = 4696.72 FEET.
******************
 FLOW PROCESS FROM NODE 21244.00 TO NODE 21245.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1372.00 DOWNSTREAM ELEVATION(FEET) = 1330.00
 STREET LENGTH (FEET) = 1339.26 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.66
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.66
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.77
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.01
 STREET FLOW TRAVEL TIME (MIN.) = 3.30 Tc (MIN.) = 19.65
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.440
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.63 0.75 0.600
                              5.33 0.75 0.600
 SCHOOL
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 16.96 SUBAREA RUNOFF (CFS) = 30.39
 EFFECTIVE AREA(ACRES) = 66.96 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 67.0 PEAK FLOW RATE (CFS) = 120.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
```

File name: LR0212ZZ.RES

Page 38

Date: 04/21/2014

TOTAL AREA (ACRES) = 50.0 PEAK FLOW RATE (CFS) = 102.45

Date: 04/21/2014 File name: LR0212ZZ.RES Page 37

```
END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  MOBILE HOME PARK
                                                                                                        В
                                                                                                               4.66 0.75 0.250 56
 DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.90
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 6.80 DEPTH*VELOCITY (FT*FT/SEC.) = 5.06
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                  SUBAREA AREA(ACRES) = 7.36 SUBAREA RUNOFF(CFS) = 14.30
                                                                                  EFFECTIVE AREA(ACRES) = 74.32 AREA-AVERAGED Fm(INCH/HR) = 0.43
 ESTIMATED PIPE DIAMETER(INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
                                                                                  TOTAL AREA (ACRES) = 74.3 PEAK FLOW RATE (CFS) = 134.48
 PIPE-FLOW VELOCITY(FEET/SEC.) = 30.60
 PIPE-FLOW(CFS) = 96.22
 PIPEFLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 17.09
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.654
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 SUBAREA AREA(ACRES) = 16.96 SUBAREA RUNOFF(CFS) = 33.66
 TOTAL AREA (ACRES) = 67.0 PEAK FLOW RATE (CFS) = 132.94
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 33.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.07 DEPTH*VELOCITY (FT*FT/SEC.) = 4.95
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                  ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 36.72
                                                                                  ASSUME FULL-FLOWING PIPELINE
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 26.58
   STREET FLOW DEPTH(FEET) = 0.54
                                                                                  PIPE-FLOW(CFS) = 105.77
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 17.68
   HALFSTREET FLOOD WIDTH (FEET) = 18.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.89
                                                                                  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.600
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.62
                                                                                  SUBAREA AREA (ACRES) = 7.36 SUBAREA RUNOFF (CFS) = 15.35
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21245.00 = 6035.98 FEET.
                                                                                  TOTAL AREA(ACRES) = 74.3
                                                                                                                 PEAK FLOW RATE (CFS) = 145.07
******************
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 FLOW PROCESS FROM NODE 21245.00 TO NODE 21246.00 IS CODE = 63
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
-----
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 39.30
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                                    STREET FLOW DEPTH (FEET) = 0.58
 UPSTREAM ELEVATION(FEET) = 1330.00 DOWNSTREAM ELEVATION(FEET) = 1311.00
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 21.17
 STREET LENGTH (FEET) = 939.73 CURB HEIGHT (INCHES) = 8.0
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.21
 STREET HALFWIDTH (FEET) = 26.00
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
                                                                                  LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21246.00 = 6975.71 FEET.
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 ****************
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 1
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 _____
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   TOTAL NUMBER OF STREAMS = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
                                                                                  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                  TIME OF CONCENTRATION (MIN.) = 17.68
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 140.09
                                                                                  RAINFALL INTENSITY (INCH/HR) = 2.60
   ***STREET FLOWING FULL***
                                                                                  AREA-AVERAGED Fm(INCH/HR) = 0.43
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75
   STREET FLOW DEPTH(FEET) = 0.82
                                                                                  AREA-AVERAGED Ap = 0.58
                                                                                  EFFECTIVE STREAM AREA(ACRES) = 74.32
   HALFSTREET FLOOD WIDTH (FEET) = 33.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.17
                                                                                  TOTAL STREAM AREA(ACRES) = 74.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.08
                                                                                  PEAK FLOW RATE (CFS) AT CONFLUENCE = 145.07
 STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 19.63
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.442
                                                                                  ** CONFLUENCE DATA **
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                   STREAM
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                  αA
                                                        SCS
                                                                                   NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    1
                                                                                            615.99 20.03 2.412 0.74(0.45) 0.61 348.7 21230.00
 RESIDENTIAL
                                                                                            617.37 21.70 2.299 0.74(0.45) 0.61 371.5 21213.10
 "3-4 DWELLINGS/ACRE" B
                                2.70
                                         0.75
                                                 0.600 56
                                                                                            616.76 21.75 2.296 0.74(0.45) 0.61 371.7 21210.00
                                                                                        Date: 04/21/2014 File name: LR0212ZZ.RES
       Date: 04/21/2014
                       File name: LR0212ZZ.RES
                                                       Page 39
```

Page 40

-	606.00	00.00	0 100	0 547	0 461	0 60	200 6	01000 0	_
								21220.00	
1	596.94	24.64	2.130	0.74(	0.46)	0.62	396.1	21200.00 21213.30	)
1	521.90	30.23	1.885	0.74(	0.46)	0.62	406.2	21213.30	)
2	145.07	17.68	2.600	0.75(	0.43)	0.58	74.3	21240.00	)
DATMEATT	INTENSITY	AND DIME	OF COMO	יח ג כוחוגים	TOM DAG	PTO.			
	E FORMULA				ION NA.	110			
CONFLUENC	E FORMULA	OSED FOR	Z SIKE	AMS.					
** DEAK F	LOW RATE T	ARIE **							
			ntensity	Fn (1	√m)	An	Ae	HEADWATER	
NIIMBED	(CFS)	(MTN ) (	тиси / ир \	(TNCH	/HD)	110	(ACDES)	NODE	
1	740 72	17 68	2 600	0 747	0 45)	0 60	382 0	21240 0	1
2	748 50	20 03	2.000	0.74(	0.45)	0.00	423 N	21240.00	) 1
3	740.30	21 70	2 200	0.74(	0.45)	0.00	115 8	21230.00	) 1
4	742.50	21.70	2 296	0.74(	0.45)	0.01	446.0	21213.10	) 1
5	723 06	23 69	2 1 2 2	0.74(	0.45)	0.01	161 0	21210.00	) 1
6	723.30	24.64	2.130	0.74(	0.45)	0.01	404.5	21220.00	) 1
7	610.00	30 23	1 885	0.74(	0.45)	0.01	470.5	21213.30	) 1
,	015.05	30.23	1.005	0.71(	0.43)	0.01	400.5	21213.30	,
COMPILED	CONFLUENCE	ESTIMAT	ES ARE A	S FOLL	NG.				
						20	0.3		
EFFECTIVE	RATE (CFS) AREA (ACRE	S) =	423 00	AREA-	-AVERAC	ED Em	(INCH/HR)	= 0.45	
	AGED Fp(IN							0.15	
	A(ACRES) =			111/11/11/11	V 11/1/1011	2 110	0.00		
	/			0 TO NO	ODE 21	1246.0	0 = 1206	0.60 FEET	
									-
*****	*****	*****	*****	*****	*****	*****	*****	*****	**
FLOW PROC	ESS FROM N	ODE 212	46.00 TO	NODE	21247	.00 IS	CODE = 4	18	
	UTE BOX-FL								
	G USER-SPE								
========									==
	DATA: UPS	,	,				(FEET) =	1290.00	
	TH(FEET) =								
	BASEWIDTH								
	IN BOX IS			X-FLOW	VELOC:	ITY (FE	ET/SEC.) =	= 21.44	
	CFS) =			_	/	_			
	TRAVEL TIM							0 44 5555	
LONGEST F.	LOWPATH FR	OM NODE	21213.3	U TO NO	JDE 2.	1247.0	0 = 133.	19.44 FEET	•
****	*******	******	******	*****	*****	*****	******	*******	* *
	ESS FROM N								
								, <u>.</u>	
=========	TION OF SU	BARRA TU	MAINLIN	E PEAK	FIOW<	<<<<			==
MAINLINE '	TION OF SU			E PEAK	FLOW<	<<<< ======			
		======	======	E PEAK =====	FLOW<	<<<< =====	======		
* 100 YEA	======= Tc(MIN.) =	21.01	======	=====	=====	<<<< ======	======		
* 100 YEAR SUBAREA LO	======= Tc(MIN.) = R RAINFALL OSS RATE D	21.01 INTENSI ATA (AMC	====== TY(INCH/ II):	====== HR) =	2.344		======		
* 100 YEAR SUBAREA LO	======= Tc(MIN.) = R RAINFALL OSS RATE D	21.01 INTENSI ATA (AMC	====== TY(INCH/ II):	====== HR) =	2.344		 Ap	SCS	
* 100 YEA SUBAREA LO DEVELOPMI	======================================	21.01 INTENSI ATA (AMC SCS	TY(INCH/ II): SOIL	====== HR) = AREA	2.344 Fp	====	Ap		
* 100 YEA SUBAREA LO DEVELOPMI LAND RESIDENTIA	TC(MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (A	====== HR) = AREA	2.344 Fp	====	(DECIMAL)	CN	
* 100 YEA SUBAREA LO DEVELOPMI LAND RESIDENTIA	TC(MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (A	HR) =  AREA  CRES)	2.344 Fp (INCH)	 /HR)	(DECIMAL)	CN	
* 100 YEA SUBAREA LO DEVELOPMI LAND RESIDENTIA	TC(MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (A	HR) =  AREA  CRES)	2.344 Fp (INCH)	 /HR)	(DECIMAL)		
* 100 YEA SUBAREA LO DEVELOPM LAND RESIDENTIA "3-4 DWELL COMMERCIA	TC(MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (AB B	HR) =  AREA CRES)  23.54 1.26	2.344 Fp (INCH)	/HR) .75	(DECIMAL)	CN 56 56	
* 100 YEAI SUBAREA LO DEVELOPM LAND RESIDENTI "3-4 DWELL COMMERCIAL MOBILE HOL	Tc(MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (ABB BBB	HR) =  AREA CRES)  23.54 1.26 0.22	2.344 Fp (INCH,	/HR) .75 .75	0.600 0.100 0.250	CN 56 56 56	
* 100 YEAI SUBAREA LO DEVELOPM LAND RESIDENTI "3-4 DWELL COMMERCIAL MOBILE HOL	TC (MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE L ME PARK RAL FAIR C	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (ABB BBB	HR) =  AREA CRES)  23.54 1.26 0.22	2.344 Fp (INCH,	/HR) .75 .75	0.600 0.100	CN 56 56 56	
* 100 YEAI SUBAREA LO DEVELOPM LAND RESIDENTI "3-4 DWELL COMMERCIA: MOBILE HOL AGRICULTUI "ORCHARDS	TC (MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE L ME PARK RAL FAIR C	21.01 INTENSI ATA (AMC SCS GR	TY(INCH/ II): SOIL OUP (ABB BBB	HR) =  AREA CRES)  23.54 1.26 0.22 1.80	2.344  Fp (INCH,	/HR) .75 .75 .75	(DECIMAL) 0.600 0.100 0.250	CN 56 56 56	
* 100 YEAI SUBAREA LO DEVELOPM LAND RESIDENTI "3-4 DWELL COMMERCIAL MOBILE HOL AGRICULTUI "ORCHARDS SUBAREA A'	TC (MIN.) = R RAINFALL OSS RATE D ENT TYPE/ USE AL LINGS/ACRE L ME PARK RAL FAIR C	21.01 INTENSI ATA (AMC SCS GR "  OVER	TY(INCH/ II): SOIL OUP (A B B B B SS RATE,	HR) =  AREA CRES)  23.54  1.26  0.22  1.80  Fp(ING	2.344  Fp (INCH, 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.	/HR) .75 .75 .75 .63 = 0.	(DECIMAL) 0.600 0.100 0.250	CN 56 56 56	

```
SUBAREA AREA(ACRES) = 26.82
                            SUBAREA RUNOFF (CFS) = 45.94
 EFFECTIVE AREA(ACRES) = 449.82 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 507.4
                             PEAK FLOW RATE (CFS) = 768.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 ** PEAK FLOW RATE TABLE **
  STREAM
           Q
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
         763.92 18.60 2.522 0.74 (0.45) 0.60 408.9 21240.00
         771.36 20.90 2.351 0.74(0.45) 0.60 449.8 21230.00
         765.37 22.53 2.248 0.74(0.45) 0.61 472.6 21213.10
         765.68 22.53 2.248 0.74(0.45) 0.61 472.8 21210.00
         748.08 24.43 2.141 0.74(0.45) 0.61
                                            491.7 21220.00
         735.14 25.35 2.094 0.74(0.45) 0.61
                                            497.3 21200.00
         642.04 30.94 1.859 0.74(0.45) 0.61
                                             507.4 21213.30
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 771.36 Tc (MIN.) = 20.90
 AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA(ACRES) =
*******************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21167.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1031.19 Tc (MIN.) = 25.49
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.53
 TOTAL AREA (ACRES) = 741.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1031.19 Tc (MIN.) = 25.49
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.53
 TOTAL AREA (ACRES) =
                  741.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
*****************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 41 Date: 04/21/2014 File name: LR0212ZZ.RES Page 42

```
*************************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21147.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1320.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1290.00
 FLOW LENGTH (FEET) = 1357.45 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 90.0 INCH PIPE IS 67.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 29.25
 PIPE-FLOW(CFS) = 1031.19
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 26.26
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21147.00 = 15122.94 FEET.
*******************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 26.26
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.050
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                       В
                                0.01
                                         0.75
                                                 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                                7.68
                                         0.75
                                                 0.600
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                                2.53
                                         0.63
                                               1.000
                        В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699
 SUBAREA AREA(ACRES) = 10.22
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.89;1H= 1.17;3H= 1.89;6H= 2.56;24H= 5.08
 S-GRAPH: VALLEY(DEV.) = 92.2%; VALLEY(UNDEV.)/DESERT= 7.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.44; LAG(HR) = 0.35; Fm(INCH/HR) = 0.49; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
                                             751.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234; Lca/L=0.6,n=.0218
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 162.32
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1016.04
 TOTAL AREA (ACRES) = 751.6
                               PEAK FLOW RATE (CFS) = 1031.19
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                  FLOW VELOCITY (FEET/SEC.) = 26.60 FLOW DEPTH (FEET) = 3.81
TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 26.55
```

```
FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1031.19 Tc (MIN.) = 26.26
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.53
 TOTAL AREA (ACRES) = 751.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           0
                Tc Intensity Fp(Fm)
                                                    HEADWATER
                                             (ACRES) NODE
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
    1
          763.92 18.60 2.522 0.74(0.45) 0.60
                                               408.9 21240.00
          771.36 20.90 2.351 0.74(0.45) 0.60
                                               449.8 21230.00
          765.37 22.53 2.248 0.74(0.45) 0.61
                                               472.6 21213.10
          765.68 22.53
                      2.248 0.74(0.45) 0.61
                                               472.8 21210.00
          748.08 24.43 2.141 0.74(0.45) 0.61
                                               491.7 21220.00
          735.14 25.35
                        2.094 0.74(0.45) 0.61
                                               497.3 21200.00
          642.04 30.94
                       1.859 0.74(0.45) 0.61
                                               507.4 21213.30
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21247.00 = 13319.44 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.89;1H= 1.17;3H= 1.90;6H= 2.58;24H= 5.11
 S-GRAPH: VALLEY(DEV.) = 93.7%; VALLEY(UNDEV.)/DESERT= 6.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.44; LAG(HR) = 0.35; Fm(INCH/HR) = 0.48; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1259.0
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234; Lca/L=0.6,n=.0218
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 280.97
 PEAK FLOW RATE (CFS) = 1684.30
*******************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21248.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1290.00 DOWNSTREAM(FEET) = 1280.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 452.82 CHANNEL SLOPE = 0.0221
 CHANNEL BASE (FEET) = 9.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 1684.30
```

File name: LR021277.RFS

Date: 04/21/2014 Date: 04/21/2014 File name: LR021277.RFS Page 43

Page 44

```
LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 26.55
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.037
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp Ap SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                  в 37.17
                                 0.75
                                           0.250
                    в 10.19
 COMMERCIAL
                                           0.100 56
                                    0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 34.08 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 SUBAREA AREA(ACRES) = 81.44
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.43;30M= 0.90;1H= 1.18;3H= 1.91;6H= 2.59;24H= 5.14
 S-GRAPH: VALLEY(DEV.) = 94.1%; VALLEY(UNDEV.)/DESERT= 5.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.44; LAG(HR) = 0.35; Fm(INCH/HR) = 0.46; Ybar = 0.50
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0280; Lca/L=0.4,n=.0251; Lca/L=0.5,n=.0231; Lca/L=0.6,n=.0215
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 306.96
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1796.65
 TOTAL AREA (ACRES) = 1340.4 PEAK FLOW RATE (CFS) = 1796.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1340.4 TC (MIN.) =
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.50
 PEAK FLOW RATE (CFS) = 1796.65
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 45 Date: 04/21/2014 File name: LR0212ZZ.RES Page 46

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21378

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0213ZZ.DAT

TIME/DATE OF STUDY: 14:17 02/28/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 0.67 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

	20.0	10.0	0.020/0.02	20/0.020	0.50	1.5	0.0312	1.125	0.0180
8	26.0	15.0	0.020/0.02	20/0.020	0.67	2.0	0.0312	0.167	0.0180
9	52.0	20.0	0.020/0.02	20/0.020	0.67	2.0	0.0312	.167	0.0180
*S:	1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL 1	ve Flow- aximum Al n)*(Veloc WITH A F TO THE UP	DEPTH CONSTI Depth = 0.2 lowable Stre ity) Constra LOW CAPACITY STREAM TRIBU	20 FEET eet Flow I aint = 6. 7 GREATER JTARY PIPE	.0 (FT*F' THAN E.*	T/S)		CTED	
] : : : :	WATERSHEI USED "VAI 1 UNITS/# FOR DEVEI PRECIPIT# SIERRA M#	D LAG = 0 LLEY UNDE ACRE AND : LOPMENTS OF ATION DATE ADRE DEPT	EL SELECTION .80 * TC VELOPED" S-( LESS; AND "V DF 2 UNITS/I A ENTERED ON H-AREA FACTO CONDITION	GRAPH FOR VALLEY DEV ACRE AND N SUBAREA DRS USED.	DEVELOPI /ELOPED" /ORE. BASIS.	S-GR	АРН	GRAPH	METHOD:
	OW PROCES		**************************************						*****
			D INITIAL SU	JBAREA ANA	ALYSIS<<	<<<			
			NTRATION NON ========= W-LENGTH(FER						=====
IN: ELI Tc SUI * :	ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN	BAREA FLOODATA: UPS' ENGTH** 3 ALYSIS US: RAINFALL AND LOSS		ET) = 70 = 1665 FION CHANG FC(MIN.) = ENCH/HR) = AMC II): IL AREA	D2.11 .00 DOWN GE)]**0 = 10.3: = 3.593	====: NSTRE 20 26	======================================	= 16	30.00 Tc
IN: ELI Tc SUI * : SUI DI	ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL	BAREA FLOODATA: UPS' ENGTH** 3 ALYSIS US: RAINFALL AND LOSS NT TYPE/ USE	W-LENGTH (FEI TREAM (FEET)  .00) / (ELEVAT ED MINIMUM T INTENSITY (I RATE DATA (I SCS SOI GROUP	ET) = 7( = 1665. FION CHANG FC(MIN.) = ENCH/HR) = AMC II): IL AREA (ACRES)	D2.11 .00 DOWN GE)]**0 = 10.3 = 3.593 Fp	NSTRE, 20 26 /HR)	AM (FEET) =  AM (FEET) =	= 16 SCS CN	30.00 Tc (MIN.
IN: ELI Tc SUI * : SUI DI RE:	ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAI DWELLING SIDENTIAI	BAREA FLOODATA: UPS' CONGTH** 3 ALYSIS US: RAINFALL AND LOSS WT TYPE/ JSE SS/ACRE"	W-LENGTH (FEE TREAM (FEET)  .00) / (ELEVAT ED MINIMUM T INTENSITY (I RATE DATA (I SCS SOI GROUP B	ET) = 70 = 1665 FION CHANG FC (MIN.) = INCH/HR) = AMC II): IL AREA (ACRES)	D2.11 .00 DOWN GE)]**0.: = 10.3: = 3.593 Fp (INCH	NSTRE 20 26 /HR)	AP (DECIMAL) 0.700	= 16 SCS CN	Tc (MIN.)
IN: ELII Tc SUI *: SUI PI RE: "3. SUI SUI SUI	EVATION I  K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAI DWELLING SIDENTIAI -4 DWELLI BAREA AVE BAREA AVE BAREA RUN	BAREA FLOODATA: UPS' CNGTH** 3 ALYSIS US: RAINFALL AND LOSS WI TYPE/ JSE CSS/ACRE" LNGS/ACRE CRAGE PER	W-LENGTH (FEE TREAM (FEET)  .00) / (ELEVAT ED MINIMUM T INTENSITY (I RATE DATA (I SCS SOI GROUP B	ET) = 70 = 1665  FION CHANG FC(MIN.) = INCH/HR) = AMC II): IL AREA (ACRES)  3.89  1.29  RATE, FP(I FRACTION,	D2.11 .00 DOWN GE)]**0.: = 10.3: = 3.593 Fp (INCH. D 0 INCH/HR) Ap = 0	NSTRE. 20 26  /HR) .75 .75 = 0 .675	Ap (DECIMAL) 0.700 0.600	= 16 SCS CN 56 56	30.00 Tc (MIN.
TC SUI * : SUI DI SUI TO' SUI	ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAN DWELLING SIDENTIAN -4 DWELLI BAREA AVE BAREA AVE BAREA RUN TAL AREA	BAREA FLOODATA: UPS  ENGTH** 3 ALYSIS US: RAINFALL AND LOSS WI TYPE/ USE  ESS/ACRE"  LINGS/ACRE ERAGE PER ROFF(CFS) (ACRES) = EA-AVERAGE	W-LENGTH (FEE PREAM (FEET)  .00) / (ELEVAN ED MINIMUM TINTENSITY (I RATE DATA (A SCS SOI GROUP  B WI B WIOUS LOSS F VIOUS AREA F = 14.40	ET) = 70 = 1665  FION CHANG FC (MIN.) = INCH/HR) = INCH	D2.11 .00 DOWI GE)]**0.3 = 10.3 = 3.593 Fp (INCH O	NSTREA 20 26 /HR) .75 .75 = 0 .675 CFS)	Ap (DECIMAL)  0.700  0.600 .75	SCS CN 56 56	TC (MIN. 10.9 10.3
TC SUI * : : SUI DI RES "3 : SUI SUI TO SUI SUI SUI FE SUI SUI FE SUI SUI FE SUI SUI FE SUI	EXTIGATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND ( SIDENTIAL DWELLING SIDENTIAL -4 DWELLING BAREA AVE BAREA A	BAREA FLOODATA: UPS' BAREA FLOODATA: UPS' BAREA FLOODATA: UPS' BALYSIS US: RAINFALL AND LOSS WITTYPE/ USE BACKE" BACKER B	W-LENGTH (FEE TREAM (FEET)  .00) / (ELEVAT ED MINIMUM T INTENSITY (I SCS SOI GROUP  B WIOUS LOSS H VIOUS AREA H 5.18  ED RAINFALL 95; 1HR = 1.	ET) = 70 = 1665  FION CHANC FC(MIN.) = 1 INCH/HR) = 1 AMC II): IL AREA (ACRES)  3.89  1.29  RATE, FP(1 FRACTION, ) PEAK FLO DEPTH(INC .25; 3HR =	DU RATE (CH): = 2.03;	NSTRE 20 26 /HR) .75 .75 = 0 .675 CFS) : 6HR = *****	Ap (DECIMAL) 0.700 0.600 .75 = 14.4 2.75; 24F	SCS CN 56 56 10 HR = 5	Tc (MIN. 10.99 10.35
TC SUI * : SUI DI SUI SUI SUI SUI SUI SUI SUI SUI SUI SU	ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC LAND I SIDENTIAL DWELLING SIDENTIAL -4 DWELLING BAREA AVE	BAREA FLOODATA: UPS' BAREA FLOODATA: UPS' BAREA FLOODATA: UPS' BAREA FLOODATA: UPS' BAREA FLOOTATA: USE BAREA PER BAREA PER BAREA PER BARAGE	W-LENGTH (FEI PREAM (FEET)  .00) / (ELEVAT ED MINIMUM TINTENSITY (I RATE DATA (I SCS SOI GROUP  B WIOUS LOSS I VIOUS AREA I = 14.4( 5.18  ED RAINFALL 95; 1HR = 1.	ET) = 70 = 1665  FION CHANG FC (MIN.) = 100H/HR) = 100H/HR) = 100H/HR  AMC II): IL AREA (ACRES)  3.89  1.29  RATE, FP (100H/HR) = 100H/HR  PEAK FLO  DEPTH (INC. 25; 3HR = 100H/HR)  To NODE	DW RATE (CH): = 2.03;  EXECUTE:  22.11  .00 DOWN  .00 DOWN  .01  .00 DOWN  .01  .00 DOWN  .01  .00 DOWN  .	NSTRE 20 226 /HR) .75 .75 = 0 .675 CFS) : 6HR = ***** .00 I:	Ap (DECIMAL) 0.700 0.600 .75 = 14.4 2.75; 24F	SCS CN 56 56 40 HR = 5	Tc (MIN.: 10.98 10.33

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.46
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 11.17
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.428
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                      Fρ
                                               Дp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.06 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA (ACRES) = 2.35 SUBAREA RUNOFF (CFS) = 6.16
 EFFECTIVE AREA(ACRES) = 7.53 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 7.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.71
 FLOW VELOCITY (FEET/SEC.) = 3.40 DEPTH*VELOCITY (FT*FT/SEC.) = 1.57
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21302.00 = 868.13 FEET.
******************
 FLOW PROCESS FROM NODE 21302.00 TO NODE 21303.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1627.00 DOWNSTREAM ELEVATION(FEET) = 1623.00
 STREET LENGTH (FEET) = 202.20 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.62
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 12.10
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.267
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 1.93 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.36 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 2.29 SUBAREA RUNOFF (CFS) = 5.68
 EFFECTIVE AREA(ACRES) = 9.82 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 9.8 PEAK FLOW RATE (CFS) = 24.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.80
 FLOW VELOCITY (FEET/SEC.) = 3.71 DEPTH*VELOCITY (FT*FT/SEC.) = 1.79
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21303.00 = 1070.33 FEET.
******************
 FLOW PROCESS FROM NODE 21303.00 TO NODE 21304.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1623.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 190.38 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   26.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.48
```

Page 4

Date: 04/21/2014 File name: LR0213ZZ.RES Page 3 Date: 04/21/2014 File name: LR0213ZZ.RES

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.87
                                                                                RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.42 Tc (MIN.) = 12.52
                                                                                 "2 DWELLINGS/ACRE"
                                                                                                   B 3.59 0.75 0.700 56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.200
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 SUBAREA AREA (ACRES) = 4.39 SUBAREA RUNOFF (CFS) = 10.24
                                        Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                EFFECTIVE AREA(ACRES) = 16.04 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.38
                                        0.75
                                                0.700
                                                                                TOTAL AREA (ACRES) = 16.0 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.02; 6HR = 2.74; 24HR = 5.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA (ACRES) = 1.83 SUBAREA RUNOFF (CFS) = 4.44
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 11.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.79 DEPTH*VELOCITY (FT*FT/SEC.) = 3.06
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) =
                                                         28.23
                                                                                LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21305.00 = 1528.16 FEET.
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                                 FLOW PROCESS FROM NODE 21305.00 TO NODE 21306.00 IS CODE = 63
                                                                               ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.20
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 7.59 DEPTH*VELOCITY (FT*FT/SEC.) = 2.96
                                                                               _____
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21304.00 = 1260.71 FEET.
                                                                                UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1555.00
                                                                                STREET LENGTH (FEET) = 439.49 CURB HEIGHT (INCHES) = 6.0
******************
                                                                                STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21304.00 TO NODE 21305.00 IS CODE = 63
______
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 267.45 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET FLOW DEPTH(FEET) = 0.51
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 18.26
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.74
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.40
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 14.29
                                                                                * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.957
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.44
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   HALFSTREET FLOOD WIDTH (FEET) = 15.54
                                                                                     LAND USE
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.58
                                                                                RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.88
                                                                                 "2 DWELLINGS/ACRE" B 8.99
                                                                                                                        0.75
 STREET FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 13.20
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 2.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.101
                                                                                                                       0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 αA
                                                       SCS
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.680
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA (ACRES) = 11.28 SUBAREA RUNOFF (CFS) = 24.86
 RESIDENTIAL
                                                                                EFFECTIVE AREA(ACRES) = 27.32 AREA-AVERAGED Fm(INCH/HR) = 0.51
 "3-4 DWELLINGS/ACRE" B
                               0.80
                                        0.75
                                                0.600 56
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
```

Page 5

Date: 04/21/2014

File name: LR0213ZZ.RES

Date: 04/21/2014 File name: LR0213ZZ.RES Page 6

0.700

56

56

37.42

```
TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) = 60.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.01; 6HR = 2.71; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.48
 FLOW VELOCITY (FEET/SEC.) = 7.24 DEPTH*VELOCITY (FT*FT/SEC.) = 3.83
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21306.00 = 1967.65 FEET.
******************
 FLOW PROCESS FROM NODE 21306.00 TO NODE 21307.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1555.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
 STREET LENGTH (FEET) = 430.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 21.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.87
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.43
 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 15.20
  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.849
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                  Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.82
                                         0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 11.14
                                       0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                               SUBAREA RUNOFF(CFS) = 31.57
 SUBAREA AREA(ACRES) = 14.96
 EFFECTIVE AREA(ACRES) = 42.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 42.3 PEAK FLOW RATE (CFS) =
                                                        89.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.81; 6HR = 2.30; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.41
```

```
LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21307.00 = 2398.23 FEET.
FLOW PROCESS FROM NODE 21307.00 TO NODE 21308.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 STREET LENGTH (FEET) = 417.62 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   99 41
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.23
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.31
 STREET FLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 16.31
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.731
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.69 0.75 0.600
                                                       56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.54 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.664
 SUBAREA AREA(ACRES) = 10.23 SUBAREA RUNOFF(CFS) = 20.57
 EFFECTIVE AREA(ACRES) = 52.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 52.5 PEAK FLOW RATE(CFS) = 105.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.20
 FLOW VELOCITY (FEET/SEC.) = 6.32 DEPTH*VELOCITY (FT*FT/SEC.) = 4.45
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21308.00 = 2815.85 FEET.
FLOW PROCESS FROM NODE 21308.00 TO NODE 21309.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
```

FLOW VELOCITY (FEET/SEC.) = 8.27 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.87

Page 7

```
>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1520.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1445.00
 FLOW LENGTH (FEET) = 2140.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.80
 PIPE-FLOW(CFS) = 105.17
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.80 Tc (MIN.) = 18.12
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21309.00 = 4956.48 FEET.
*****
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21309.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 18.12
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.564
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                          Ap SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 52.35 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 52.35 SUBAREA RUNOFF (CFS) = 99.67
 EFFECTIVE AREA(ACRES) = 104.86 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA(ACRES) = 104.9
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.95; 6HR = 2.59; 24HR = 5.50
*********************
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21310.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1445.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1415.00
 FLOW LENGTH (FEET) = 762.02 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 31.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.25
 PIPE-FLOW(CFS) = 196.98
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.52 Tc (MIN.) = 18.64
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21310.00 = 5718.50 FEET.
FLOW PROCESS FROM NODE 21310.00 TO NODE 21310.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
```

```
MAINLINE Tc(MIN.) = 18.64
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.521
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 18.20
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 18.20 SUBAREA RUNOFF (CFS) = 33.94
 EFFECTIVE AREA(ACRES) = 123.06 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 123.1
                              PEAK FLOW RATE(CFS) =
                                                   226.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.02; 6HR = 2.73; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21310.00 TO NODE 21311.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1415.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1356.00
 FLOW LENGTH (FEET) = 1371.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 25.72
 PIPE-FLOW(CFS) = 226.81
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 19.53
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21311.00 = 7089.84 FEET.
*****
 FLOW PROCESS FROM NODE 21311.00 TO NODE 21311.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 19.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.451
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           Aр
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                     0.75 0.600
                                                    56
                    В
                            19.39
 SCHOOL
                      В
                            10.62
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                            SUBAREA RUNOFF(CFS) = 54.08
 SUBAREA AREA(ACRES) = 30.01
 EFFECTIVE AREA(ACRES) = 153.07 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 153.1 PEAK FLOW RATE (CFS) =
                                                 273.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.00; 6HR = 2.69; 24HR = 5.50
```

File name: LR0213ZZ.RES

Page 10

Date: 04/21/2014

Date: 04/21/2014 File name: LR0213ZZ.RES Page 9

```
*************************
 FLOW PROCESS FROM NODE 21311.00 TO NODE 21312.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1356.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1310.00
 FLOW LENGTH (FEET) = 1393.37 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.5 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.44
 PIPE-FLOW(CFS) = 273.20
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 20.48
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21312.00 = 8483.21 FEET.
*******************
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21312.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 20.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.382
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                            77.43
                                            0.600
                                    0.75
                                                    56
                     В
                            5.45
                                      0.75
                                              0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 82.88
                              SUBAREA RUNOFF(CFS) = 144.23
 EFFECTIVE AREA(ACRES) = 235.95 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 235.9 PEAK FLOW RATE (CFS) = 407.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.01; 6HR = 2.70; 24HR = 5.48
*********************
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21313.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1310.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1285.00
 FLOW LENGTH (FEET) = 759.92 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 43.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.07
 PIPE-FLOW(CFS) = 407.94
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 20.95
```

```
LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21313.00 = 9243.13 FEET.
******************
 FLOW PROCESS FROM NODE 21313.00 TO NODE 21313.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 20.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.350
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 10.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 10.40
                            SUBAREA RUNOFF(CFS) = 17.80
 EFFECTIVE AREA(ACRES) = 246.35 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA(ACRES) = 246.3
                              PEAK FLOW RATE(CFS) =
                                                  418.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.86; 6HR = 2.40; 24HR = 4.78
******************
 FLOW PROCESS FROM NODE 21313.00 TO NODE 21360.00 IS CODE = 48
-----
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1255.00
 FLOW LENGTH (FEET) = 1079.23 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 3.01 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 23.21
 BOX-FLOW(CFS) = 418.93
 BOX-FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 21.72
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 21.72
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.300
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           Аp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             4.55
                                  0.75 0.600
                                                   56
                                            0.250
 MOBILE HOME PARK
                    В
                           1.01
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.536
 SUBAREA AREA (ACRES) = 5.56 SUBAREA RUNOFF (CFS) = 9.50
 EFFECTIVE AREA(ACRES) = 251.91 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA(ACRES) = 251.9
                              PEAK FLOW RATE(CFS) =
                                                  418.93
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

File name: LR0213ZZ.RES

Page 12

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.80; 6HR = 2.27; 24HR = 4.75
*************************
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
*****************
 FLOW PROCESS FROM NODE 21320.00 TO NODE 21321.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.31
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.841
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.489
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                          Ар
                                                SCS Tc
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           7.00
                                   0.75 0.600 56 10.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 19.16
 TOTAL AREA (ACRES) = 7.00 PEAK FLOW RATE (CFS) =
                                          19.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21321.00 TO NODE 21322.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1450.00 DOWNSTREAM(FEET) = 1420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 725.48 CHANNEL SLOPE = 0.0414
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           19.16
 FLOW VELOCITY (FEET/SEC.) = 2.31 FLOW DEPTH (FEET) = 0.41
 TRAVEL TIME (MIN.) = 5.23 Tc (MIN.) = 16.07
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21322.00 = 1636.79 FEET.
*******************
 FLOW PROCESS FROM NODE 21322.00 TO NODE 21322.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.07
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.755
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                    Fр
                                                   SCS
                                             Αр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           9.15 0.75 0.600
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.15
                             SUBAREA RUNOFF(CFS) = 18.99
 EFFECTIVE AREA(ACRES) = 16.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 16.1
                              PEAK FLOW RATE(CFS) =
                                                    33.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.27
*******************
 FLOW PROCESS FROM NODE 21322.00 TO NODE 21332.00 IS CODE = 42
._____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1420.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
 FLOW LENGTH (FEET) = 1402.23 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 11.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.57
 PIPE-FLOW(CFS) =
                 33.52
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 17.49
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 17.49
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.619
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Aр
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           9.34
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.34 SUBAREA RUNOFF (CFS) = 18.25
 EFFECTIVE AREA(ACRES) = 25.49 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 25.5 PEAK FLOW RATE(CFS) =
                                                 49.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 13

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 14

```
"3-4 DWELLINGS/ACRE"
                                                                                                   B 22.89 0.75 0.600 56
______
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                              SUBAREA AREA (ACRES) = 22.89 SUBAREA RUNOFF (CFS) = 49.04
 TIME OF CONCENTRATION (MIN.) = 17.49
                                                                               EFFECTIVE AREA (ACRES) = 32.56 AREA-AVERAGED Fm (INCH/HR) = 0.45
 RAINFALL INTENSITY (INCH/HR) = 2.62
 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                               TOTAL AREA (ACRES) = 32.6
                                                                                                            PEAK FLOW RATE (CFS) = 69.76
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 25.49
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
 TOTAL STREAM AREA(ACRES) = 25.49
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                   49.80
                                                                              STREET CROSS-SECTION INFORMATION:
******************
                                                                              CURB HEIGHT (INCHES) = 6.0
                                                                                                        STREET HALFWIDTH (FEET) = 18.00
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 FLOW PROCESS FROM NODE 21330.00 TO NODE 21331.00 IS CODE = 21
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
_____
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 870.87
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1425.00
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                              STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.920
                                                                              STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 47.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.003
                                                                                ***STREET FLOWING FULL***
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                STREET FLOW DEPTH(FEET) = 0.50
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                     SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 18.13
 RESIDENTIAL
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.50
 "3-4 DWELLINGS/ACRE" B
                             9.67
                                    0.75 0.600 56 13.92
                                                                                PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.27
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               LONGEST FLOWPATH FROM NODE 21330.00 TO NODE 21332.00 = 2157.22 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                             ************************
 SUBAREA RUNOFF (CFS) = 22.23
 TOTAL AREA (ACRES) =
                     9.67 PEAK FLOW RATE (CFS) =
                                                                               FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
                                                                             ______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.27
                                                                              >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                             ______
TOTAL NUMBER OF STREAMS = 2
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 21331.00 TO NODE 21332.00 IS CODE = 33
______
                                                                              TIME OF CONCENTRATION (MIN.) = 15.38
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                              RAINFALL INTENSITY (INCH/HR) = 2.83
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.45
______
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
                                                                              AREA-AVERAGED Ap = 0.60
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
                                                                              EFFECTIVE STREAM AREA(ACRES) = 32.56
 FLOW LENGTH (FEET) = 1286.35 MANNING'S N = 0.013
                                                                              TOTAL STREAM AREA(ACRES) = 32.56
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 69.76
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                               ** CONFLUENCE DATA **
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 9.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.61
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                   HEADWATER
 PIPE-FLOW(CFS) =
                  22.23
                                                                               NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                            (ACRES) NODE
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                               1
                                                                                        49.80 17.49 2.619 0.75(0.45) 0.60 25.5 21320.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 15.38
                                                                                        69.76 15.38 2.829 0.75(0.45) 0.60 32.6 21330.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.829
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                                              CONFLUENCE FORMULA USED FOR 2 STREAMS.
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                               ** PEAK FLOW RATE TABLE **
       Date: 04/21/2014
                                                                                    Date: 04/21/2014 File name: LR0213ZZ.RES
                                                                                                                                  Page 16
```

File name: LR021377.RFS

Page 15

```
Ap Ae HEADWATER
  STREAM
            0
                 Tc Intensity Fp(Fm)
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
   1
         117.79 15.38 2.829 0.75(0.45) 0.60 55.0 21330.00
         113.40 17.49 2.619 0.75(0.45) 0.60 58.0 21320.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 117.79 Tc (MIN.) = 15.38
 EFFECTIVE AREA(ACRES) = 54.97 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                    58.0
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
*****
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21355.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1355.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 766.86 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 26.5 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.10
 PIPE-FLOW(CFS) = 117.79
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 15.98
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET.
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 15.98
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.765
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fρ
                                            αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                   B 14.76 0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.76 SUBAREA RUNOFF (CFS) = 30.76
 EFFECTIVE AREA(ACRES) = 69.73 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 72.8 PEAK FLOW RATE(CFS) = 145.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.36
*****************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
```

```
*******************
 FLOW PROCESS FROM NODE 21340.00 TO NODE 21341.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 528.12
 ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1530.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.378
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.396
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                               Αр
                                                     SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56
                                       0.75
                                              0.600
                                                      56
                                                          7.38
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 3.79 0.75 0.700
                                                      56
                                                          7.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA RUNOFF (CFS) = 15.20
 TOTAL AREA(ACRES) = 4.35 PEAK FLOW RATE(CFS) = 15.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21341.00 TO NODE 21342.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1490.00
 STREET LENGTH (FEET) = 644.80 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 39.30
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.01
 STREET FLOW TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) =
                                               9.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.887
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                      Fр
                                                      SCS
                                               Αр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

File name: LR0213ZZ.RES

Page 18

Date: 04/21/2014

```
RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" B 10.28
                                        0.75
                                                0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                              5.38 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA(ACRES) = 15.66 SUBAREA RUNOFF(CFS) = 48.10
 EFFECTIVE AREA (ACRES) = 20.01 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) = 20.0 PEAK FLOW RATE (CFS) =
                                                         61.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.53 HALFSTREET FLOOD WIDTH (FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 7.45 DEPTH*VELOCITY (FT*FT/SEC.) = 3.93
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21342.00 = 1172.92 FEET.
*******************
 FLOW PROCESS FROM NODE 21342.00 TO NODE 21343.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1425.00
 STREET LENGTH (FEET) = 1308.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                120.53
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.82
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.62
 STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 11.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.350
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                     Fρ
                                               αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.19
                                        0.75
                                                0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 33.88
                                        0.75
                                                0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA(ACRES) = 46.07
                               SUBAREA RUNOFF(CFS) = 118.03
```

```
EFFECTIVE AREA(ACRES) = 66.08 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 66.1 PEAK FLOW RATE (CFS) = 169.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.49
 FLOW VELOCITY (FEET/SEC.) = 9.36 DEPTH*VELOCITY (FT*FT/SEC.) = 6.83
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 12.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 38.68
 PIPE-FLOW(CFS) =
                   61.30
 PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 9.62
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.749
 SUBAREA AREA (ACRES) = 46.07 SUBAREA RUNOFF (CFS) = 134.55
 TOTAL AREA(ACRES) = 66.1
                                PEAK FLOW RATE (CFS) = 193.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 132.06
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.93
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21343.00 = 2480.92 FEET.
*****
  FLOW PROCESS FROM NODE 21343.00 TO NODE 21354.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 1461.18 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.78
 PIPE-FLOW(CFS) = 193.36
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 10.74
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 19

File name: LR0213ZZ.RES

Page 20

Date: 04/21/2014

```
_____
 MAINLINE Tc(MIN.) = 10.74
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.510
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            Aρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             23.13
                                      0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 23.13
                             SUBAREA RUNOFF (CFS) = 63.71
 EFFECTIVE AREA(ACRES) = 89.21 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
                             PEAK FLOW RATE (CFS) = 242.84
 TOTAL AREA (ACRES) = 89.2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.47
*******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 10.74
 RAINFALL INTENSITY (INCH/HR) = 3.51
 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.65
 EFFECTIVE STREAM AREA(ACRES) = 89.21
 TOTAL STREAM AREA(ACRES) = 89.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 242.84
******************
 FLOW PROCESS FROM NODE 21350.00 TO NODE 21351.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 820.03
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1510.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.778
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.502
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Αр
                                                    SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             4.46
                                      0.75
                                             0.700
                                                   56 11.46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.41
                                      0.75
                                             0.600 56 10.78
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA RUNOFF (CFS) = 13.08
 TOTAL AREA (ACRES) = 4.87 PEAK FLOW RATE (CFS) =
```

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 21351.00 TO NODE 21352.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1480.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.29 CHANNEL SLOPE = 0.1270
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 13.08
 FLOW VELOCITY (FEET/SEC.) = 3.22 FLOW DEPTH (FEET) = 0.29
 TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 12.00
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.00 = 1056.32 FEET.
******************
 FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 12.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.283
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                    Fρ
                                            Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 1.96
                                     0.75
                                          0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 2.18 SUBAREA RUNOFF (CFS) = 5.43
 EFFECTIVE AREA(ACRES) = 7.05 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 7.1 PEAK FLOW RATE (CFS) = 17.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.50
***********************
 FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.50 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1480.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 FLOW LENGTH (FEET) = 207.56 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 6.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.36
 PIPE-FLOW(CFS) =
                 17.55
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 12.20
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 22

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.50 = 1263.88 FEET.
*******************
 FLOW PROCESS FROM NODE 21352.50 TO NODE 21352.50 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 12.20
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.251
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                              Ap
                                                    SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.89
                                              0.600
                                      0.75
                                                     56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 6.98
                                      0.75
                                             0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689
 SUBAREA AREA(ACRES) = 7.87 SUBAREA RUNOFF(CFS) = 19.37
 EFFECTIVE AREA(ACRES) = 14.92 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 14.9
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.27
FLOW PROCESS FROM NODE 21352.50 TO NODE 21353.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1460.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1450.00
 FLOW LENGTH (FEET) = 277.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 12.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.24
 PIPE-FLOW(CFS) =
                  36 72
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 12.50
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21353.00 = 1540.88 FEET.
******************
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21353.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 12.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.203
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Αp
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             1.59
                     В
                                      0.75
                                              0.600
                                                     56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                              7.66
                                      0.75
                                              0.700
                                                    56
       Date: 04/21/2014
                      File name: LR0213ZZ.RES
                                                   Page 23
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 9.25
                             SUBAREA RUNOFF(CFS) = 22.41
 EFFECTIVE AREA(ACRES) = 24.17 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 24.2
                               PEAK FLOW RATE(CFS) =
                                                      58.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.27
******************
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21354.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1450.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 2039.85 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 15.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.06
 PIPE-FLOW(CFS) =
                   58.49
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.99 Tc (MIN.) = 14.50
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21354.00 = 3580.73 FEET.
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.50
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.931
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                      Fρ
                                                     SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     в 33.72
                                       0.75
                                               0.600
                                                      56
 COMMERCIAL
                             0.32
                                       0.75
                                               0.100
                                                      56
 RESIDENTIAL
                     B 1.48
 "2 DWELLINGS/ACRE"
                                       0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 35.52
                              SUBAREA RUNOFF (CFS) = 79.36
 EFFECTIVE AREA(ACRES) = 59.69 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) =
                   59.7
                               PEAK FLOW RATE(CFS) =
                                                     131.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 5.28
*****************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
```

File name: LR0213ZZ.RES

Date: 04/21/2014

Page 24

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.368
______
 TOTAL NUMBER OF STREAMS = 2
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
 TIME OF CONCENTRATION (MIN.) = 14.50
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RAINFALL INTENSITY (INCH/HR) = 2.93
                                                                          RESIDENTIAL
 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                          "3-4 DWELLINGS/ACRE" B 6.86 0.75 0.600
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.64
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 EFFECTIVE STREAM AREA(ACRES) = 59.69
                                                                          SUBAREA AREA (ACRES) = 6.86 SUBAREA RUNOFF (CFS) = 18.03
                                                                          EFFECTIVE AREA(ACRES) = 140.28 AREA-AVERAGED Fm(INCH/HR) = 0.48
 TOTAL STREAM AREA(ACRES) = 59.69
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 131.94
                                                                          TOTAL AREA (ACRES) = 155.8 PEAK FLOW RATE (CFS) =
                                                                                                                         364.67
 ** CONFLUENCE DATA **
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  STREAM
          Q Tc Intensity Fp(Fm)
                                                  HEADWATER
                                       Ap Ae
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
                                                                          5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.91
   1
          242.84 10.74 3.510 0.75(0.48) 0.65 89.2 21340.00
                                                                        ******************
    2
         131.94 14.50 2.931 0.75(0.48) 0.64 59.7 21350.00
                                                                          FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 11
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                          >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY
                                                                        _____
 ** PEAK FLOW RATE TABLE **
                                                                          ** MAIN STREAM CONFLUENCE DATA **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                           STREAM
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
   1
          363.59 10.74 3.510 0.75(0.48) 0.64 133.4 21340.00
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    2
          328.35 14.50 2.931 0.75(0.48) 0.64 148.9 21350.00
                                                                                   363.59 11.56 3.358 0.75(0.48) 0.64 140.3 21340.00
                                                                           1
                                                                                  330.23 15.32 2.835 0.75(0.48) 0.64 155.8 21350.00
                                                                            2
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                          LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET.
 PEAK FLOW RATE (CFS) = 363.59 Tc (MIN.) = 10.74
                                                                          ** MEMORY BANK # 2 CONFLUENCE DATA **
 EFFECTIVE AREA(ACRES) = 133.42 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
                                                                           STREAM
                                                                                Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 TOTAL AREA(ACRES) = 148.9
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                  145.04 16.03 2.760 0.75(0.45) 0.60 69.7 21330.00
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
                                                                           1
                                                                                  138.50 18.14 2.562 0.75(0.45) 0.60 72.8 21320.00
******************
                                                                          LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET.
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21355.00 IS CODE = 42
                                                                          ** PEAK FLOW RATE TABLE **
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                           STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                           NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
_____
                                                                           1
                                                                                   495.25 11.56 3.358 0.75(0.47) 0.63 190.6 21340.00
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
                                                                                  473.42 15.32 2.835 0.75(0.47) 0.63 222.4 21350.00
                                                                                  464.70 16.03 2.760 0.75(0.47) 0.63
                                                                                                                      225.5 21330.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 1308.82 MANNING'S N = 0.013
                                                                                   430.47 18.14 2.562 0.75(0.47) 0.63 228.6 21320.00
                                                                           TOTAL AREA(ACRES) =
                                                                                                228.6
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 40.1 INCHES
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PIPE-FLOW VELOCITY(FEET/SEC.) = 28.69
                                                                          PEAK FLOW RATE (CFS) = 495.25 Tc (MIN.) = 11.557
                                                                          EFFECTIVE AREA(ACRES) = 190.57 AREA-AVERAGED Fm(INCH/HR) = 0.47
 PIPE-FLOW(CFS) = 363.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 PIPEFLOW TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 11.50
                                                                          TOTAL AREA(ACRES) = 228.6
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET.
                                                                          LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET.
******************
                                                                        ******************
                                                                          FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 12
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         >>>>CLEAR MEMORY BANK # 2 <<<<
_____
                                                                        MAINLINE Tc(MIN.) = 11.50
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 25 Date: 04/21/2014 File name: LR0213ZZ.RES Page 26

```
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21356.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1325.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1315.00
 FLOW LENGTH (FEET) = 763.37 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 56.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.98
 PIPE-FLOW(CFS) = 495.25
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 12.19
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21356.00 = 6014.29 FEET.
*******************
 FLOW PROCESS FROM NODE 21356.00 TO NODE 21356.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 12.19
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.252
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                           4.42
                                  0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 4.42 SUBAREA RUNOFF (CFS) = 11.15
 EFFECTIVE AREA(ACRES) = 194.99 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 233.0
                           PEAK FLOW RATE(CFS) = 495.25
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.87
******************
 FLOW PROCESS FROM NODE 21356.00 TO NODE 21357.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1315.00 DOWNSTREAM(FEET) = 1296.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 552.93 CHANNEL SLOPE = 0.0344
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 12.18 FLOW DEPTH (FEET) = 2.93
 TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 12.95
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21357.00 = 6567.22 FEET.
******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21357.00 IS CODE = 81
```

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 12.95
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.136
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           qΑ
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                            38.32 0.75 0.600
 "3-4 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 38.32
                             SUBAREA RUNOFF (CFS) = 92.69
 EFFECTIVE AREA(ACRES) = 233.31 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 271.3
                              PEAK FLOW RATE(CFS) =
                                                   560.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21358.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1296.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.89 CHANNEL SLOPE = 0.0215
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 560.39
 FLOW VELOCITY (FEET/SEC.) = 10.61 FLOW DEPTH (FEET) = 3.51
 TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 13.75
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21358.00 = 7079.11 FEET.
******************
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21358.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 13.75
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.025
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             7.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 17.16
 EFFECTIVE AREA(ACRES) = 240.71 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 278.7
                              PEAK FLOW RATE(CFS) =
                                                   560.39
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

File name: LR0213ZZ.RES

Page 28

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21359.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1267.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 575.39 CHANNEL SLOPE = 0.0313
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 560.39
 FLOW VELOCITY (FEET/SEC.) = 12.16 FLOW DEPTH (FEET) = 3.20
 TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 14.54
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21359.00 = 7654.50 FEET.
******************
 FLOW PROCESS FROM NODE 21359.00 TO NODE 21359.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 14.54
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.926
 SUBAREA LOSS RATE DATA (AMC II):
                                 Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                          Аp
                                                 SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
COMMERCIAL B
                            4.95
                                    0.75
                                           0.600 56
                            2.16
                                    0.75
                                           0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448
 SUBAREA AREA(ACRES) = 7.11 SUBAREA RUNOFF(CFS) = 16.58
 EFFECTIVE AREA(ACRES) = 247.82 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 285.8
                            PEAK FLOW RATE (CFS) = 560.39
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
**********************
 FLOW PROCESS FROM NODE 21359.00 TO NODE 21360.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1267.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1255.00
 FLOW LENGTH (FEET) = 711.66 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 78.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 78.0 INCH PIPE IS 53.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 22.91
 PIPE-FLOW(CFS) = 560.39
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.52 Tc (MIN.) = 15.06
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET.
```

FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc(MIN.) = 15.06\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.865 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 3.67 0.75 0.600 56 в 0.92 0.75 0.250 MOBILE HOME PARK 56 COMMERCIAL B 0.01 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.529 SUBAREA AREA (ACRES) = 4.60 SUBAREA RUNOFF (CFS) = 10.22 EFFECTIVE AREA(ACRES) = 252.42 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62 TOTAL AREA (ACRES) = 290.4 PEAK FLOW RATE (CFS) = 560.39NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY \_\_\_\_\_\_ \*\* MAIN STREAM CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) HEADWATER Аe NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 558.86 15.15 2.855 0.75 (0.46) 0.62 252.4 21340.00 529.39 18.95 2.496 0.75 (0.46) 0.62 284.3 21350.00 519.64 19.67 2.441 0.75(0.46) 0.62 287.3 21330.00 482.97 21.85 2.292 0.75(0.46) 0.62 290.4 21320.00 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET. \*\* MEMORY BANK # 1 CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 418.93 21.72 2.300 0.75(0.46) 0.61 251.9 21300.00 1 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET. \*\* PEAK FLOW RATE TABLE \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 939.14 15.15 2.855 0.75 (0.46) 0.62 428.1 21340.00 933.86 18.95 2.496 0.75(0.46) 0.62 504.1 21350.00 928.08 19.67 2.441 0.75(0.46) 0.62 515.5 21330.00 903.97 21.72 2.300 0.75(0.46) 0.62 542.2 21300.00 900.12 21.85 2.292 0.75(0.46) 0.62 542.3 21320.00 542.3 TOTAL AREA (ACRES) = COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 939.14 Tc (MIN.) = 15.148 EFFECTIVE AREA(ACRES) = 428.08 AREA-AVERAGED Fm(INCH/HR) = 0.46

Date: 04/21/2014

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
*****************
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21361.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 770.40 CHANNEL SLOPE = 0.0195
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                          939.14
 FLOW VELOCITY (FEET/SEC.) = 11.51 FLOW DEPTH (FEET) = 4.06
 TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 16.26
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21361.00 = 11092.76 FEET.
******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE TC(MIN.) = 16.26
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.736
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         11.84
                                        0.600
                                             56
                  В
                                 0.75
 MOBILE HOME PARK
                   В
                         3.43
                                 0.75
                                        0.250
 COMMERCIAL
                          1.54
                                 0.75
                                        0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.483
 SUBAREA AREA (ACRES) = 16.81
                          SUBAREA RUNOFF (CFS) = 35.93
 EFFECTIVE AREA(ACRES) = 444.89 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 559.1
                           PEAK FLOW RATE(CFS) =
                                             939.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.98; 6HR = 2.66; 24HR = 4.84
******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
_____
FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 15.1
```

```
>>>> DEFINE MEMORY BANK # 2 <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1796.65 Tc (MIN.) = 26.55
 AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.50
 TOTAL AREA (ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1796.65 Tc (MIN.) = 26.55
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.50
 TOTAL AREA(ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
*******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21361.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1280.00 DOWNSTREAM(FEET) = 1240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1507.42 CHANNEL SLOPE = 0.0265
 CHANNEL BASE (FEET) = 9.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1796.65
 FLOW VELOCITY (FEET/SEC.) = 28.96 FLOW DEPTH (FEET) = 3.76
 TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 27.41
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
*******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 27.41
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.000
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                Fρ
                                               SCS
                                         αA
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                          42.57
                                  0.75
                                         0.600
                                               56
 MOBILE HOME PARK
                         41.35
                                         0.250
                    В
                                  0.75
                                               56
 COMMERCIAL
                          17.40
                                  0.75
                                         0.100
                                               56
 AGRICULTURAL FAIR COVER
```

File name: LR0213ZZ.RES

Page 32

Date: 04/21/2014

```
"ORCHARDS"
                        B 0.33 0.63 1.000 65
                                                                                 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 466.52
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 PEAK FLOW RATE (CFS) = 2588.96
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
 SUBAREA AREA(ACRES) = 101.65
                                                                                FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 12
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.92;6H= 2.60;24H= 5.14
 S-GRAPH: VALLEY(DEV.) = 94.5%; VALLEY(UNDEV.) / DESERT = 5.5%
                                                                                 >>>>CLEAR MEMORY BANK # 1 <<<<
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.46; LAG(HR) = 0.37; Fm(INCH/HR) = 0.45; Ybar = 0.49
                                                                                *************************
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
                                                                                 FLOW PROCESS FROM NODE 21361.00 TO NODE 21378.00 IS CODE = 54
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1442.0
                                                                                 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
                                                                                 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                _____
  Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221; Lca/L=0.6,n=.0206
                                                                                 ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 1235.00
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 337.63
                                                                                 CHANNEL LENGTH THRU SUBAREA (FEET) = 988.61 CHANNEL SLOPE = 0.0051
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1903.12
                                                                                 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 TOTAL AREA (ACRES) = 1442.0 PEAK FLOW RATE (CFS) = 1903.12
                                                                                 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
                                                                                 CHANNEL FLOW THRU SUBAREA(CFS) = 2588.96
                                                                                 FLOW VELOCITY (FEET/SEC.) = 17.10 FLOW DEPTH (FEET) = 6.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.17
                                                                                 TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 28.38
                                                                                 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
*******************
                                                                                *****************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 11
                                                                                 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
                                                                                 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                                ______
 ** MAIN STREAM CONFLUENCE DATA **
                                                                                 MAINLINE Tc(MIN.) = 28.38
 PEAK FLOW RATE (CFS) = 1903.12
                                Tc(MIN.) = 27.41
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.959
 AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.49
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 TOTAL AREA(ACRES) = 1442.0
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                                                        SCS
                                                                                                                                 αA
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
                                                                                 RESIDENTIAL
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                      В
                                                                                                              4.75
                                                                                                                         0.75
                                                                                                                                 0.600
                                                                                                                                         56
                                                                                                       В
                                                                                                              11.57
                                                                                                                         0.75
                                                                                                                                 0.100
                                                                                                                                         56
  STREAM
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 COMMERCIAL
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 MOBILE HOME PARK
                                                                                                       В
                                                                                                              12.66
                                                                                                                         0.75
                                                                                                                                 0.250
           939.14 16.26 2.736 0.75(0.46) 0.61 444.9 21340.00
    1
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
          933.86 20.07 2.411 0.75(0.46) 0.61
                                                520.9 21350.00
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.247
     3
          928.08 20.79 2.361 0.75 (0.46) 0.61
                                                532.3 21330.00
                                                                                 SUBAREA AREA(ACRES) = 28.98
           903.97 22.85
                         2.231 0.75(0.46)0.61
                                                559.0 21300.00
                                                                                 UNIT-HYDROGRAPH DATA:
          900.12 22.98
                         2.224 0.75(0.46) 0.61
                                                  559.1 21320.00
                                                                                 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.90;6H= 2.54;24H= 5.14
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21361.00 = 11092.76 FEET.
                                                                                 S-GRAPH: VALLEY(DEV.) = 96.1%; VALLEY(UNDEV.) / DESERT = 3.9%
                                                                                         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                 Tc(HR) = 0.47; LAG(HR) = 0.38; Fm(INCH/HR) = 0.45; Ybar = 0.49
 UNIT-HYDROGRAPH DATA:
                                                                                 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.90;6H= 2.54;24H= 5.15
                                                                                 DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;
 S-GRAPH: VALLEY(DEV.) = 96.0%; VALLEY(UNDEV.) / DESERT = 4.0%
                                                                                 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2030.2
 Tc(HR) = 0.46; LAG(HR) = 0.37; Fm(INCH/HR) = 0.45; Ybar = 0.49
                                                                                 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;
                                                                                  Lca/L=0.3,n=.0264; Lca/L=0.4,n=.0236; Lca/L=0.5,n=.0217; Lca/L=0.6,n=.0203
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
                                                                                 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 475.57
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2001.2
                                                                                 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2553.34
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
                                                                                 TOTAL AREA(ACRES) = 2030.2
                                                                                                                 PEAK FLOW RATE (CFS) = 2588.96
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221; Lca/L=0.6,n=.0206
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 33 Date: 04/21/2014 File name: LR0213ZZ.RES Page 34

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.85; 6HR = 2.36; 24HR = 4.75
FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE(CFS) = 2588.96 Tc(MIN.) = 28.38
 AREA-AVERAGED Fm (INCH/HR) = 0.45 Ybar = 0.49
 TOTAL AREA (ACRES) = 2030.2
******************
 FLOW PROCESS FROM NODE 21370.00 TO NODE 21371.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 627.80
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1390.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.620
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.311
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           3.63
                                  0.75 0.600
                                                  56 10.33
 COMMERCIAL
                    В
                           3.67
                                  0.75 0.100 56 7.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349
 SUBAREA RUNOFF (CFS) = 26.61
 TOTAL AREA (ACRES) = 7.30 PEAK FLOW RATE (CFS) = 26.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*****************
 FLOW PROCESS FROM NODE 21371.00 TO NODE 21372.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1380.00
 STREET LENGTH (FEET) = 602.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    35.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 20.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.00
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.17
 STREET FLOW TRAVEL TIME (MIN.) = 2.51 Tc (MIN.) = 10.13
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.635
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                      Fр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              5.99 0.75 0.600
 COMMERCIAL
                       В
                              0.01 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.599
 SUBAREA AREA(ACRES) = 6.00
                                SUBAREA RUNOFF (CFS) = 17.21
 EFFECTIVE AREA(ACRES) = 13.30 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 13.3
                                 PEAK FLOW RATE (CFS) =
                                                          39.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.88
 FLOW VELOCITY (FEET/SEC.) = 4.17 DEPTH*VELOCITY (FT*FT/SEC.) = 2.32
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21372.00 = 1230.30 FEET.
******************
 FLOW PROCESS FROM NODE 21372.00 TO NODE 21373.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1365.00
 FLOW LENGTH (FEET) = 527.76 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 14.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.50
 PIPE-FLOW(CFS) =
                   39.38
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 10.77
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.503
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              5.16 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.16 SUBAREA RUNOFF (CFS) = 14.18
 EFFECTIVE AREA(ACRES) = 18.46 AREA-AVERAGED Fm(INCH/HR) = 0.37
```

File name: LR0213ZZ.RES

Page 36

Date: 04/21/2014

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) =
                     18.5
                                                           51.98
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                             STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 12.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.38
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21373.00 = 1758.06 FEET.
*************************
 FLOW PROCESS FROM NODE 21373.00 TO NODE 21374.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1365.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1345.00
 FLOW LENGTH (FEET) = 326.48 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 13.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.69
 PIPE-FLOW(CFS) =
                    51.98
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 11.05
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.450
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fр
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                                4.94
                                          0.75 0.600 56
                                                  0.100
 COMMERCIAL
                       В
                                0.17
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
 SUBAREA AREA(ACRES) = 5.11
                               SUBAREA RUNOFF(CFS) = 13.86
 EFFECTIVE AREA(ACRES) = 23.57 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.52
 TOTAL AREA (ACRES) = 23.6 PEAK FLOW RATE (CFS) =
                                                           64.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

```
CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 12.97
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.35
  HALFSTREET FLOOD WIDTH (FEET) = 11.01
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.88
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21374.00 = 2084.54 FEET.
******************
 FLOW PROCESS FROM NODE 21374.00 TO NODE 21375.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1345.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1330.00
 FLOW LENGTH (FEET) = 319.60 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 16.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.90
 PIPE-FLOW(CFS) =
                   64.95
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.27 Tc (MIN.) = 11.32
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21375.00 = 2404.14 FEET.
******************
 FLOW PROCESS FROM NODE 21375.00 TO NODE 21375.00 IS CODE = 81
______
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 11.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.400
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                          10.88 0.75 0.600
                            14.84 0.75 0.100
 COMMERCIAL
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.312
 SUBAREA AREA(ACRES) = 25.72 SUBAREA RUNOFF(CFS) = 73.32
 EFFECTIVE AREA(ACRES) = 49.29 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) = 49.3
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

STREET CROSS-SECTION INFORMATION:

Date: 04/21/2014 File name: LR0213ZZ.RES Page 37 Date: 04/21/2014 File name: LR0213ZZ.RES Page 38

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                          *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
******************
 FLOW PROCESS FROM NODE 21375.00 TO NODE 21376.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1330.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1275.00
 FLOW LENGTH (FEET) = 1914.40 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
                                                                           DEVELOPMENT TYPE/
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 28.5 INCHES
                                                                              LAND USE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.71
                                                                          MOBILE HOME PARK
 PIPE-FLOW(CFS) = 137.22
                                                                          RESIDENTIAL
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 12.94
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21376.00 = 4318.54 FEET.
FLOW PROCESS FROM NODE 21376.00 TO NODE 21376.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 12.94
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.138
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                            33.59
                                     0.75
                                            0.600
                                                  56
 MOBILE HOME PARK
                     В
                             3.65
                                     0.75
                                            0.250 56
                      В
                             1.26
                                     0.75
                                            0.100
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.550
 SUBAREA AREA (ACRES) = 38.50
                             SUBAREA RUNOFF (CFS) = 94.48
 EFFECTIVE AREA(ACRES) = 87.79 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
                  87.8 PEAK FLOW RATE (CFS) =
 TOTAL AREA (ACRES) =
                                                   220.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*****
 FLOW PROCESS FROM NODE 21376.00 TO NODE 21377.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1275.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1257.00
 FLOW LENGTH (FEET) = 629.69 MANNING'S N = 0.013
                                                                           DEVELOPMENT TYPE/
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
                                                                            LAND USE
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 35.8 INCHES
                                                                          MOBILE HOME PARK
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.89
                                                                          RESIDENTIAL
 PIPE-FLOW(CFS) = 220.08
```

PIPEFLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 13.42 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21377.00 = 4948.23 FEET. \* FLOW PROCESS FROM NODE 21377.00 TO NODE 21377.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc(MIN.) = 13.42\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.071 SUBAREA LOSS RATE DATA (AMC II): SCS SOIL AREA Fр SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN B 12.70 0.75 0.250 "3-4 DWELLINGS/ACRE" B 4.69 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344 SUBAREA AREA (ACRES) = 17.39 SUBAREA RUNOFF (CFS) = 44.03EFFECTIVE AREA(ACRES) = 105.18 AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45 TOTAL AREA(ACRES) = 105.2 PEAK FLOW RATE(CFS) = 258.75 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21377.00 TO NODE 21378.00 IS CODE = 42 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1257.00 DOWNSTREAM NODE ELEVATION (FEET) = 1235.00 FLOW LENGTH (FEET) = 1320.25 MANNING'S N = 0.013USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.6 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 18.68 PIPE-FLOW(CFS) = 258.75\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 14.59 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21378.00 = 6268.48 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 14.59\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.919 SUBAREA LOSS RATE DATA (AMC II): SCS SOIL AREA Fр Ар SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN 17.63 0.75 В 0.250 56 "3-4 DWELLINGS/ACRE" B 0.65 0.75 0.600 56 Date: 04/21/2014 File name: LR0213ZZ.RES Page 40

Date: 04/21/2014 File name: LR021377.RFS Page 39

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.262
 SUBAREA AREA(ACRES) = 18.28
                            SUBAREA RUNOFF(CFS) = 44.80
 EFFECTIVE AREA(ACRES) = 123.46 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
 TOTAL AREA (ACRES) = 123.5 PEAK FLOW RATE (CFS) =
                                                    289.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.59
 RAINFALL INTENSITY (INCH/HR) = 2.92
 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.42
 EFFECTIVE STREAM AREA(ACRES) = 123.46
 TOTAL STREAM AREA(ACRES) = 123.46
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 289.23
 ** CONFLUENCE DATA **
 STREAM Q TC AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
   1 2588.96 28.38 2030.17 21100.00
   2 289.23 14.59 123.46 21370.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.89;6H= 2.52;24H= 5.12
 S-GRAPH: VALLEY(DEV.) = 96.3%; VALLEY(UNDEV.) / DESERT = 3.7%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.47; LAG(HR) = 0.38; Fm(INCH/HR) = 0.44; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0264; Lca/L=0.4, n=.0236; Lca/L=0.5, n=.0217; Lca/L=0.6, n=.0203
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 507.70
 PEAK FLOW RATE (CFS) = 2711.70
FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 152
      ______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21378.DNA
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 2153.6 TC(MIN.) =
```

AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.48

File name: LR0213ZZ.RES

Page 41

Date: 04/21/2014

PEAK FLOW RATE (CFS) = 2711.70

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21470

\* 100-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0214ZZ.DAT

TIME/DATE OF STUDY: 14:17 02/28/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.67 2.00 0.0312 0.167 0.0180 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 18	20.0 26.0	10.0 15.0	0.020/0. 0.020/0.	020/0.020	0.50	2.00	0.0312 (	).125 ).167	0.0180 0.0180
19	52.0	20.0	0.020/0.	020/0.020	0.67	2.00	0.0312 (	167	0.0180
1 2 *SI OR	as (Ma as (Ma 2. (Depth ZE PIPE R EQUAL T	ve Flow-I xximum Ali 1)*(Veloc: WITH A FI O THE UPS	ity) Const LOW CAPACI STREAM TRI		.0 (FT*I THAN E.*	FT/S)		CTED	
W U 1 F P S *ANT	VATERSHED VAI UNITS/A COR DEVEI PRECIPITA SIERRA MA PECEDENT	D LAG = 0. LEY UNDEY LCRE AND 1 .OPMENTS ( .TION DATA .DRE DEPTI MOISTURE	.80 * TC /ELOPED" S LESS; AND DF 2 UNITS A ENTERED H-AREA FAC CONDITION	ONS/PARAME -GRAPH FOR "VALLEY DE /ACRE AND ON SUBAREA TORS USED. (AMC) II	DEVELOPED' MORE. BASIS. ASSUMED	" S-GRA FOR UN	PH IT HYDROC		
				*******					*****
FLC	W PROCES	S FROM NO	DE 21400	.00 TO NOL	E 21401				
				SUBAREA AN					
>>> >>U<<	>>>RATION	IAL METHOI	O INITIAL NTRATION N		ALYSIS<	 <<<< IAL SUB.	AREA<<		=====
>>> >>U ===== INI ELE TC SUB * 1	>> RATION USE TIME- TIAL SUE TVATION D  = K*[(LE BAREA ANA 00 YEAR BAREA TC CVELOPMEN	IAL METHOI OF-CONCENTATE BAREA FLOI DATA: UPST ENGTH** 3 LLYSIS USI RAINFALL AND LOSS	O INITIAL NTRATION N	SUBAREA AN OMOGRAPH F ====================================	ALYSIS < OR INIT: ====================================	.20 742	AREA<< ======= M(FEET) =	====== = 13	60.00 Tc
>>> >>U INI ELE Tc SUB * 1 SUB	>>RATION USE TIME- TIAL SUE TVATION D  = K*[(LE AAREA ANA 00 YEAR BAREA TC CVELOPMEN LAND U	ALL METHOI OF-CONCENT BAREA FLOI DATA: UPST ENGTH** 3 LLYSIS USI RAINFALL AND LOSS IT TYPE/ USE	O INITIAL NTRATION N	SUBAREA AN OMOGRAPH F ======== EET) = 5 ) = 1380 ATION CHAN TC(MIN.) (INCH/HR) (AMC II):	ALYSIS < OR INIT: ====================================	.20 742	AREA<< ======= M(FEET) =	====== = 13	60.00 Tc
>>> U INI ELE TC SUB * 1 SUB DE RES "3-	>>> RATION USE TIME- TIAL SUE VATION D  = K*[(LE BAREA ANA 00 YEAR LAND U LAND U SIDENTIAL	JAL METHOI OF-CONCENTATE TO THE PROPERTY OF TH	D INITIAL NTRATION N N-LENGTH (F FREAM (FEET .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	SUBAREA AN OMOGRAPH F ====================================	ALYSIS < OR INIT: ====================================		AREA<< =======  M(FEET) =  Ap (DECIMAL)	= 13	60.00 Tc (MIN.
>>> >> INI ELE TC SUB * 1 SUB DE RES TRES	>>> RATION USE TIME- ====================================	JAL METHOI OF-CONCEN SAREA FLOW NATA: UPS: CNGTH** 3. LLYSIS USI RAINFALL AND LOSS IT STEEL INGS/ACRE	D INITIAL NTRATION N N-LENGTH (F FREAM (FEET .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	SUBAREA AN OMOGRAPH F ======= EET) = 5 ) = 1380 ATION CHAN TC(MIN.) (INCH/HR) (INCH/HR) (AMC II): OIL AREA P (ACRES 8.1	ALYSIS < OR INIT: ======== 98.36 .00 DOW GE)]**0.= 7.5 = 4.275 Fr. (INCE) 9 (2.200)		AREA<< ========  M(FEET) =  Ap (DECIMAL)  0.600  0.700	scs cn 56	Tc (MIN. 10.4
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>> RATION USE TIME- ====================================	JAL METHOI OF-CONCEN SAREA FLOW NATA: UPS SINGTH** 3 ALYSIS USI RAINFALL AND LOSS IT TYPE/ ISE SISE SISE SISE SISE SISE SIST ACRE	D INITIAL NTRATION N N-LENGTH (F FREAM (FEET  .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B B VIOUS LOSS VIOUS AREA	SUBAREA AN OMOGRAPH F ======= EET) = 5 ) = 1380 ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  8.1  0.6 0.4 RATE, Fp( FRACTION,	ALYSIS < OR INIT: ======= 98.36 .00 DOW GE)]**0.= 7.5		AP (DECIMAL)  0.600  0.700  0.100	scs cn 56	Tc (MIN. 10.4
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>> RATION USE TIME- ====================================	ALYSIS USI RAINFALL AND LOSS IT TYPE/ ISSE SACRE "  CRAGE PERV IOFF (CFS)	D INITIAL NTRATION N N-LENGTH (F FREAM (FEET  .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B B VIOUS LOSS VIOUS AREA = 31.	SUBAREA AN OMOGRAPH F ======= EET) = 5 ) = 1380 ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  8.1  0.6 0.4 RATE, Fp( FRACTION,	ALYSIS < OR INIT: ======= 98.36 .00 DOW GE)]**0.= 7.5 = 4.275 Fr. ) (INCE 9 (4 (INCH/HR) Ap = (6 (	<pre> &lt;&lt;&lt;&lt;     IAL SUB</pre>	AP (DECIMAL)  0.600  0.700  0.100  75	scs cn 56	TC (MIN. 10.4
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	JAL METHOI OF-CONCENT SAREA FLOI JATA: UPS' CNGTH** 3 LLYSIS USI RAINFALL AND LOSS IT TYPE/ JOSE CNGS/ACRE' CRAGE PERV JOFF(CFS) JACRES) = LA-AVERAGI 30M = 0.5	D INITIAL NTRATION N N-LENGTH (F REAM (FEET .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B B VIOUS LOSS VIOUS AREA = 31. 9.25 ED RAINFAL D5; 1HR =	SUBAREA AN OMOGRAPH F ======= EET) = 5 ) = 1380 ATION CHAN I Tc (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  8.1  0.6 0.4 RATE, Fp( FRACTION, 92	ALYSIS < OR INIT: ======== 98.36 .00 DOW	CFS) =  6HR =	AP (DECIMAL)  0.600  0.700  0.100  75  31.9	SCS CN 56 56 56 56	Tc (MIN. 10.4 11.1. 7.7
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	JAL METHOI OF-CONCENT SAREA FLOW NATA: UPS: CNGTH** 3 ALYSIS USH RAINFALL AND LOSS IT TYPE/ USE CNGS/ACRE CRAGE PERV CRAGE PERV OFF(CFS) ACRES) = CA-AVERAGI 30M = 0.5  ***********************************	DINITIAL NTRATION N N-LENGTH (F FREAM (FEET  .00) / (ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU  B B JOUS LOSS JIOUS AREA - 31. 9.25 ED RAINFAL ED; 1HR =	SUBAREA AN OMOGRAPH F ======== EET) = 5 ) = 1380 ATION CHAN I Tc (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 8.1 0.6 0.4 RATE, Fp ( FRACTION, 92 PEAK FL L DEPTH (IN 1.25; 3HR	ALYSIS < OR INIT: ======== 98.36 .00 DOW	CFS) =  6HR =  *********	AREA<< ========  M(FEET) =  Ap (DECIMAL)  0.600  0.700  0.100  75  31.9	SCS CN 56 56 56 56 56 56 56 56	Tc (MIN.) 10.49 11.15 7.74

CHANNEL LENGTH THRU SUBAREA (FEET) = 415.44 CHANNEL SLOPE = 0.0578

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             31.92
 FLOW VELOCITY (FEET/SEC.) = 4.02 FLOW DEPTH (FEET) = 0.73
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 9.46
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21402.00 = 1013.80 FEET.
*******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21402.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 9.46
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.786
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Ар
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.47 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 3.47 SUBAREA RUNOFF (CFS) = 10.42
 EFFECTIVE AREA(ACRES) = 12.72 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 12.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21403.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1336.00 DOWNSTREAM(FEET) = 1327.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 198.50 CHANNEL SLOPE = 0.0453
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.86 FLOW DEPTH (FEET) = 0.81
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 10.32
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21403.00 = 1212.30 FEET.
******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21403.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 10.32
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.594
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Дp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                           3.90
 "3-4 DWELLINGS/ACRE" B
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
```

```
SUBAREA AREA(ACRES) = 3.90
                          SUBAREA RUNOFF(CFS) = 11.04
 EFFECTIVE AREA(ACRES) = 16.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 16.6
                              PEAK FLOW RATE(CFS) =
                                                47.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21404.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1310.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 389.91 CHANNEL SLOPE = 0.0436
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 47.15
 FLOW VELOCITY (FEET/SEC.) = 3.99 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 11.95
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21404.00 = 1602.21 FEET.
*******************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21404.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 11.95
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.291
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           3.41 0.75 0.600
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 3.41 SUBAREA RUNOFF(CFS) = 8.72
 EFFECTIVE AREA(ACRES) = 20.03 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 20.0 PEAK FLOW RATE (CFS) =
                                                   51.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*******************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21405.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1310.00 DOWNSTREAM(FEET) = 1295.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 295.90 CHANNEL SLOPE = 0.0507
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             51.35
 FLOW VELOCITY (FEET/SEC.) = 4.32 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 13.09
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 4

```
LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21405.00 = 1898.11 FEET.
*******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21405.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 13.09
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.116
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.54
                                              0.600 56
                                      0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 8.54
                             SUBAREA RUNOFF (CFS) = 20.50
 EFFECTIVE AREA(ACRES) = 28.57 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) =
                      28.6
                              PEAK FLOW RATE(CFS) =
                                                     68.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21406.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 314.00 CHANNEL SLOPE = 0.0318
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 20.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               68.69
 FLOW VELOCITY (FEET/SEC.) = 3.64 FLOW DEPTH (FEET) = 0.97
 TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 14.53
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21406.00 = 2212.11 FEET.
*********************
 FLOW PROCESS FROM NODE 21406.00 TO NODE 21406.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 14.53
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.927
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Ар
                                                    SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             26.61
                                      0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 26.61
                             SUBAREA RUNOFF (CFS) = 59.35
 EFFECTIVE AREA(ACRES) = 55.18 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                  55.2
                             PEAK FLOW RATE(CFS) = 123.18
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21406.00 TO NODE 21417.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1285.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
 FLOW LENGTH (FEET) = 1395.25 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.77
 PIPE-FLOW(CFS) = 97.40
 PIPEFLOW TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 16.22
 *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
 ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 35.19
 PIPE-FLOW(CFS) = 123.18
 PIPEFLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 15.19
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0050):
 PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
************************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 15.19
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.850
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                  SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                    В
                           1.06 0.75
                                          0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           5.55
                                    0.75 0.600
                   В 12.65
                                    0.75 0.250
 MOBILE HOME PARK
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA (ACRES) = 19.26 SUBAREA RUNOFF (CFS) = 44.96
 EFFECTIVE AREA(ACRES) = 74.44 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 74.4 PEAK FLOW RATE (CFS) =
                                                 164.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 2.96
******************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 5 Date: 04/21/2014 File name: LR0214ZZ.RES Page 6

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.19
 RAINFALL INTENSITY (INCH/HR) = 2.85
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) = 74.44
 TOTAL STREAM AREA(ACRES) = 74.44
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 164.31
******************
 FLOW PROCESS FROM NODE 21410.00 TO NODE 21411.00 IS CODE = 21
._____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 770.62
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1345.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.679
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.337
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fρ
                                             Аp
                                                   SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.87
                                     0.75
                                             0.600
                                                  56 11.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 1.17
                                   0.75 0.700 56 12.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.623
 SUBAREA RUNOFF (CFS) = 13.02
 TOTAL AREA(ACRES) = 5.04 PEAK FLOW RATE(CFS) = 13.02
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*****************
 FLOW PROCESS FROM NODE 21411.00 TO NODE 21412.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1345.00 DOWNSTREAM(FEET) = 1312.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 618.61 CHANNEL SLOPE = 0.0533
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              13.02
 FLOW VELOCITY (FEET/SEC.) = 2.35 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 4.39 Tc (MIN.) = 16.06
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21412.00 = 1389.23 FEET.
*****************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21412.00 IS CODE = 81
```

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 16.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.756
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.50 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                             SUBAREA RUNOFF(CFS) = 15.57
 SUBAREA AREA(ACRES) = 7.50
 EFFECTIVE AREA(ACRES) = 12.54 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA(ACRES) = 12.5
                              PEAK FLOW RATE(CFS) =
                                                    25.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21413.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1312.00 DOWNSTREAM(FEET) = 1300.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 262.39 CHANNEL SLOPE = 0.0457
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              25.96
 FLOW VELOCITY (FEET/SEC.) = 2.60 FLOW DEPTH (FEET) = 0.45
 TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 17.75
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21413.00 = 1651.62 FEET.
*******************
 FLOW PROCESS FROM NODE 21413.00 TO NODE 21413.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 17.75
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.596
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                   SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           1.80
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 1.80
                            SUBAREA RUNOFF (CFS) = 3.48
 EFFECTIVE AREA(ACRES) = 14.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 14.3
                              PEAK FLOW RATE(CFS) =
                                                   27.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21413.00 TO NODE 21414.00 IS CODE = 54
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 7 Date: 04/21/2014 File name: LR0214ZZ.RES Page 8

```
MAINLINE Tc(MIN.) = 20.18
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.404
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                        SUBAREA LOSS RATE DATA (AMC II):
______
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                 αA
 ELEVATION DATA: UPSTREAM(FEET) = 1300.00 DOWNSTREAM(FEET) = 1287.00
                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           LAND USE
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.82 CHANNEL SLOPE = 0.0400
                                                                        MOBILE HOME PARK
                                                                                          B 0.54 0.75 0.250
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                           B 1.31 0.75 0.850
                                                                        PUBLIC PARK
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                        RESIDENTIAL
                                                                        "3-4 DWELLINGS/ACRE" B 0.69 0.75 0.600
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.52 FLOW DEPTH (FEET) = 0.47
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TRAVEL TIME (MIN.) = 2.15 Tc (MIN.) = 19.90
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.655
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21414.00 = 1976.44 FEET.
                                                                        SUBAREA AREA (ACRES) = 2.54 SUBAREA RUNOFF (CFS) = 4.38
                                                                        EFFECTIVE AREA(ACRES) = 22.78 AREA-AVERAGED Fm(INCH/HR) = 0.46
******************
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 FLOW PROCESS FROM NODE 21414.00 TO NODE 21414.00 IS CODE = 81
                                                                        TOTAL AREA (ACRES) = 22.8 PEAK FLOW RATE (CFS) =
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
______
                                                                        5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 MAINLINE Tc(MIN.) = 19.90
                                                                       *******************
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.424
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        FLOW PROCESS FROM NODE 21415.00 TO NODE 21416.00 IS CODE = 42
                                                                       ______
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 "3-4 DWELLINGS/ACRE" B 5.90
                                 0.75 0.600 56
                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1277.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                        DOWNSTREAM NODE ELEVATION (FEET) = 1263.00
 SUBAREA AREA(ACRES) = 5.90 SUBAREA RUNOFF(CFS) = 10.49
                                                                        FLOW LENGTH (FEET) = 509.70 MANNING'S N = 0.013
 EFFECTIVE AREA(ACRES) = 20.24 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
                                                                        USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) = 35.90
                                                                        DEPTH OF FLOW IN 36.0 INCH PIPE IS 15.0 INCHES
                                                                        PIPE-FLOW VELOCITY (FEET/SEC.) = 14.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        PIPE-FLOW(CFS) =
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                        *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 20.77
******************
                                                                        LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21416.00 = 2749.44 FEET.
 FLOW PROCESS FROM NODE 21414.00 TO NODE 21415.00 IS CODE = 42
                                                                       >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                        FLOW PROCESS FROM NODE 21416.00 TO NODE 21416.00 IS CODE = 81
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                       ______
_____
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
 UPSTREAM NODE ELEVATION (FEET) = 1287.00
                                                                       ______
 DOWNSTREAM NODE ELEVATION (FEET) = 1277.00
                                                                        MAINLINE Tc (MIN.) = 20.77
 FLOW LENGTH (FEET) = 263.30 MANNING'S N = 0.013
                                                                        * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.362
                                                                        SUBAREA LOSS RATE DATA (AMC II):
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                                        Fρ
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.9 INCHES
                                                                          LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                 2.38 0.75 0.250 56
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.71
                                                                        MOBILE HOME PARK
                                                                                           В
 PIPE-FLOW(CFS) = 35.90
                                                                        PUBLIC PARK
                                                                                            В
                                                                                                   2.15
                                                                                                           0.75 0.850
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 20.18
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21415.00 = 2239.74 FEET.
                                                                        SUBAREA AREA (ACRES) = 4.53 SUBAREA RUNOFF (CFS) = 8.00
                                                                        EFFECTIVE AREA(ACRES) = 27.31 AREA-AVERAGED Fm(INCH/HR) = 0.45
******************
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 FLOW PROCESS FROM NODE 21415.00 TO NODE 21415.00 IS CODE = 81
                                                                        TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
_____
                                                                        5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

SCS

56

56

39.91

47.06

Page 10

Date: 04/21/2014 File name: LR0214ZZ.RES Date: 04/21/2014 File name: LR0214ZZ.RES Page 9

```
************************
                                                                          ** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 21416.00 TO NODE 21417.00 IS CODE = 42
                                                                          STREAM
                                                                                   0
                                                                                        Tc Intensity Fp(Fm) Ap Ae HEADWATER
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                          NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                           1 164.31 15.19 2.850 0.75(0.40) 0.53 74.4 21400.00
                                                                                 48.71 21.21 2.333 0.75(0.44) 0.59 28.6 21410.00
 UPSTREAM NODE ELEVATION (FEET) = 1263.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
                                                                          RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 FLOW LENGTH (FEET) = 417.28 MANNING'S N = 0.013
                                                                          CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                          ** PEAK FLOW RATE TABLE **
 USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 15.2 INCHES
                                                                          STREAM
                                                                                  Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.67
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 PIPE-FLOW(CFS) =
                 47.06
                                                                           1
                                                                                  208.74 15.19 2.850 0.75(0.41) 0.54 94.9 21400.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                  178.37 21.21 2.333 0.75(0.41) 0.55 103.1 21410.00
 PIPEFLOW TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 21.21
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21417.00 = 3166.72 FEET.
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                          PEAK FLOW RATE (CFS) = 208.74 Tc (MIN.) = 15.19
*******************
                                                                          EFFECTIVE AREA(ACRES) = 94.94 AREA-AVERAGED Fm(INCH/HR) = 0.41
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
______
                                                                          TOTAL AREA (ACRES) = 103.1
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
______
                                                                        ******************
 MAINLINE Tc(MIN.) = 21.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.333
                                                                          FLOW PROCESS FROM NODE 21417.00 TO NODE 21418.00 IS CODE = 42
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        ______
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap SCS
                                                                          >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                         >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 COMMERCIAL
                    B
                           0.24
                                  0.75
                                           0.100 56
                                                                        _____
 RESIDENTIAL
                                                                          UPSTREAM NODE ELEVATION (FEET) = 1250.00
 "3-4 DWELLINGS/ACRE" B 0.73 MOBILE HOME PARK B 0.34
                                     0.75
                                            0.600
                                                 56
                                                                          DOWNSTREAM NODE ELEVATION (FEET) = 1218.00
                                    0.75
                                            0.250
                                                                          FLOW LENGTH (FEET) = 2374.87 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.418
                                                                          USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 SUBAREA AREA (ACRES) = 1.31 SUBAREA RUNOFF (CFS) = 2.38
                                                                          USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 EFFECTIVE AREA(ACRES) = 28.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 12.73
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                          PIPE-FLOW(CFS) = 180.72
 TOTAL AREA(ACRES) = 28.6
                            PEAK FLOW RATE(CFS) =
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 3.11 Tc (MIN.) = 18.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                          *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
                                                                          ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
******************
                                                                          DEPTH OF FLOW IN 39.0 INCH PIPE IS 29.1 INCHES
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 31.39
______
                                                                          PIPE-FLOW(CFS) = 208.74
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 16.45
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
                                                                          *PARALLEL PIPE SYSTEM (MANNING'S N = .0050):
 TOTAL NUMBER OF STREAMS = 2
                                                                          PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET.
 TIME OF CONCENTRATION (MIN.) = 21.21
                                                                        ******************
 RAINFALL INTENSITY (INCH/HR) = 2.33
 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                          FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.59
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 EFFECTIVE STREAM AREA(ACRES) = 28.62
                                                                        TOTAL STREAM AREA(ACRES) = 28.62
                                                                          MAINLINE Tc(MIN.) = 16.45
```

Page 11

Date: 04/21/2014 File name: LR0214ZZ.RES

Date: 04/21/2014 File name: LR0214ZZ.RES Page 12

PEAK FLOW RATE (CFS) AT CONFLUENCE =

48.71

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.717
                                                                      ******************
                                                                       FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 12
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                          3.88
                                 0.75
                                          0.600
                                                56
 COMMERCIAL
                    В
                           9.63
                                   0.75
                                          0.100
                                                56
 MOBILE HOME PARK B
                           29.24
                                   0.75
                                         0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.248
 SUBAREA AREA (ACRES) = 42.75
                           SUBAREA RUNOFF (CFS) = 97.39
 EFFECTIVE AREA(ACRES) = 137.69 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 145.8
                           PEAK FLOW RATE (CFS) = 294.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 ** PEAK FLOW RATE TABLE **
  STREAM
           0
               Tc Intensity Fp(Fm)
                                         Ae
                                                HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                          (ACRES) NODE
   1
         295.12 16.42 2.720 0.75(0.34) 0.45
                                          137.7 21400.00
         250.39 22.49 2.252 0.75(0.34) 0.46
    2
                                          145.8 21410.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 295.12 Tc (MIN.) = 16.42
 AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45 EFFECTIVE AREA(ACRES) = 137.69
*******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 10
______
                                                                           LAND USE
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                       RESIDENTIAL
_____
                                                                       "3-4 DWELLINGS/ACRE"
                                                                       COMMERCIAL
*************************
                                                                       MOBILE HOME PARK
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
_____
                                                                       UNIT-HYDROGRAPH DATA:
 PEAK FLOWRATE TABLE FILE NAME: 21378.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2711.70 Tc (MIN.) = 28.38
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.48
 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2711.70 Tc (MIN.) = 28.38
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.48
 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
```

```
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21418.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1218.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1235.33 CHANNEL SLOPE = 0.0138
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 2711.70
 FLOW VELOCITY (FEET/SEC.) = 24.97 FLOW DEPTH (FEET) = 4.80
 TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 29.20
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 29.20
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.926
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                            7.20
                    В
                                     0.75
                                             0.600
                                                    56
                      В
                            26.95
                                     0.75
                                            0 100
                                                    56
                            13.18
                                            0.250
                                                    56
                     В
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.218
 SUBAREA AREA (ACRES) = 47.33
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.89;6H= 2.52;24H= 5.11
 S-GRAPH: VALLEY (DEV.) = 96.4%; VALLEY (UNDEV.) / DESERT = 3.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.49; LAG(HR) = 0.39; Fm(INCH/HR) = 0.44; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2201.0
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0256; Lca/L=0.4, n=.0230; Lca/L=0.5, n=.0211; Lca/L=0.6, n=.0197
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 522.83
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2701.67
 TOTAL AREA(ACRES) = 2201.0
                              PEAK FLOW RATE (CFS) = 2711.70
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.84; 6HR = 2.35; 24HR = 4.75
```

Page 14

Date: 04/21/2014 Date: 04/21/2014 File name: LR021477.RFS Page 13 File name: LR021477.RFS

```
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 11
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                          _____
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
                                                                            MAINLINE Tc(MIN.) = 30.71
                                                                            * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.868
______
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 ** MAIN STREAM CONFLUENCE DATA **
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
                                                                                                                        Αp
 PEAK FLOW RATE (CFS) = 2711.70
                             Tc(MIN.) = 29.20
                                                                                LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.48
                                                                            RESIDENTIAL
 TOTAL AREA (ACRES) = 2201.0
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                               В
                                                                                                       13.22
                                                                                                                0.75
                                                                                                                        0.600
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
                                                                            COMMERCIAL
                                                                                                 В
                                                                                                        80.88
                                                                                                                0.75
                                                                                                                        0.100
                                                                                                       29.32
                                                                                                                0.75
                                                                            MOBILE HOME PARK
                                                                                                 B
                                                                                                                        0.250
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
               Tc Intensity Fp(Fm)
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
  STREAM
           0
                                        Ap Ae
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
                                                                            SUBAREA AREA(ACRES) = 123.42
          295.12 16.42 2.720 0.75(0.34) 0.45 137.7 21400.00
    1
                                                                            UNIT-HYDROGRAPH DATA:
    2
          250.39 22.49 2.252 0.75(0.34) 0.46 145.8 21410.00
                                                                            RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.88;6H= 2.49;24H= 5.06
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET.
                                                                            S-GRAPH: VALLEY(DEV.) = 96.8%; VALLEY(UNDEV.)/DESERT= 3.2%
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            Tc(HR) = 0.51; LAG(HR) = 0.41; Fm(INCH/HR) = 0.42; Ybar = 0.46
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.88;6H= 2.50;24H= 5.08
                                                                            DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;
 S-GRAPH: VALLEY(DEV.) = 96.6%; VALLEY(UNDEV.) / DESERT = 3.4%
                                                                            3HR = 0.98; 6HR = 0.99; 24HR = 1.00
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2470.2
 Tc(HR) = 0.49; LAG(HR) = 0.39; Fm(INCH/HR) = 0.43; Ybar = 0.47
                                                                            LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
                                                                            Lca/L=0.3,n=.0247; Lca/L=0.4,n=.0221; Lca/L=0.5,n=.0203; Lca/L=0.6,n=.0190
 3HR = 0.98; 6HR = 0.99; 24HR = 1.00
                                                                            TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 597.13
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2346.8
                                                                            UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2932.34
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
                                                                            TOTAL AREA (ACRES) = 2470.2 PEAK FLOW RATE (CFS) = 2932.34
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0256; Lca/L=0.4,n=.0230; Lca/L=0.5,n=.0211; Lca/L=0.6,n=.0197
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 556.88
                                                                            5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.84; 6HR = 2.35; 24HR = 4.75
 PEAK FLOW RATE (CFS) = 2866.13
                                                                          *******************
*******************
                                                                            FLOW PROCESS FROM NODE 21419.00 TO NODE 21420.00 IS CODE = 48
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 12
                                                                            >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                            >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                          _____
______
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1200.00 DOWNSTREAM(FEET) = 1170.00
*****
                                                                            FLOW LENGTH (FEET) = 3014.53 MANNING'S N = 0.014
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21419.00 IS CODE = 54
                                                                            GIVEN BOX BASEWIDTH (FEET) = 19.00 GIVEN BOX HEIGHT (FEET) = 5.00
                                                                            *GIVEN BOX HEIGHT (FEET) = 5.00 ESTIMATED BOX BASEWIDTH (FEET) = 35.60
                                                                            ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.47
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                            BOX-FLOW(CFS) = 2932.34
______
                                                                            BOX-FLOW TRAVEL TIME (MIN.) = 3.05 Tc (MIN.) = 33.76
                                                                            LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21420.00 = 24292.93 FEET.
 ELEVATION DATA: UPSTREAM(FEET) = 1218.00 DOWNSTREAM(FEET) = 1200.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1971.28 CHANNEL SLOPE = 0.0091
                                                                          ******************
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
                                                                            FLOW PROCESS FROM NODE 21420.00 TO NODE 21420.00 IS CODE = 81
 CHANNEL FLOW THRU SUBAREA(CFS) = 2866.13
 FLOW VELOCITY (FEET/SEC.) = 21.82 FLOW DEPTH (FEET) = 5.48
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 30.71
                                                                          _____
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
                                                                            MAINLINE Tc(MIN.) = 33.76
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.765
*******************
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 FLOW PROCESS FROM NODE 21419.00 TO NODE 21419.00 IS CODE = 81
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
```

SCS

56

56

SCS

Page 16

LAND USE	CDOTTD	(3 CD T C)	(TNOIT /IID)	(DECTMAL)	CNT
COMMERCIAL	GROUP B	(ACRES)	(INCH/HR)	(DECIMAL) 0.100	CN 56
MOBILE HOME PARK		59.58	0.75	0.250	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В	44.41	0.75	0.600	56
PUBLIC PARK	В	28.10	0.75	0.850	56
RESIDENTIAL	_	04.44	0.75	0 400	F.C.
"8-10 DWELLINGS/ACRE" RESIDENTIAL	В	24.44	0.75	0.400	56
"2 DWELLINGS/ACRE"	В	4.29	0.75	0.700	56
SUBAREA AVERAGE PERVIOUS					
SUBAREA AVERAGE PERVIOUS	AREA FI	RACTION, A	p = 0.365		
SUBAREA AREA(ACRES) = 2	34.35				
UNIT-HYDROGRAPH DATA:	2014 0	00 1 11 1	01 0** 1 07	644 0 47 0	A E 0.2
RAINFALL(INCH): 5M= 0.44 S-GRAPH: VALLEY(DEV.)= 9					4H= 5.03
MOUNTAIN= 0.0%					
Tc(HR) = 0.56; LAG(HR) =					
USED SIERRA MADRE DEPTH-					
DEPTH-AREA FACTORS: 5M =	-		; $1HR = 0.8$	8;	
3HR = 0.98; 6HR = 0.99;				0504.5	
UNIT-INTERVAL(MIN) = 5. LONGEST FLOWPATH FROM NO		,	,		
EQUIVALENT BASIN FACTOR			ODE 21420.	00 - 2423	72.95 FEE1.
Lca/L=0.3,n=.0241; Lca/			a/L=0.5,n=.	0199;Lca/L=	0.6, n=.0185
TIME OF PEAK FLOW(HR) =				661.38	
UNIT-HYDROGRAPH PEAK FLC					
TOTAL AREA (ACRES) =	2704.5	PEAK	FLOW RATE (	CFS) = 3	3079.58
SUBAREA AREA-AVERAGED RA	TNFAT.T. I	DEPTH (INCH	) •		
5M = 0.46; 30M = 0.95; 1				0 05 04***	
		2J, JHK -	1./9; bhk =	2.25; 24HR	R = 4.75
			·	·	
******	*****	******	*****	*****	*****
**************************************	*****	******	*****	*****	*****
FLOW PROCESS FROM NODE	****** 21420.00	************************************	********* 21421.00 I	*****	*****
	******* 21420.00 	************* ) TO NODE	******** 21421.00 I 	******** S CODE = 4	*****
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE	******** 21420.00 AVEL TIM D BOX S3	TO NODE THRU SU EE (EXIST	************ 21421.00 I BAREA<<<<  ING ELEMENT	*********  S CODE = 4 ) <<<<	*******
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM	******** 21420.00 AVEL TIM D BOX SI	**********  ) TO NODE	*********** 21421.00 I BAREA<<<<  ING ELEMENT DOWNSTREA	*********  S CODE = 4 ) <<<<	*******
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87	********* 21420.00 AVEL TIN D BOX S: ((FEET) = 4.60 N	********** ) TO NODE	********** 21421.00 I BAREA<<<<  ING ELEMENT DOWNSTREA N = 0.014	*********  S CODE = 4 ) <<<<< M(FEET) =	***************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET	******** 21420.00 AVEL TIME D BOX SI ((FEET) = 4.60 M ) = 19	*********  ) TO NODE   ME THRU SU  IZE (EXIST   = 1170.00  MANNING'S  .00 GIVE	********** 21421.00 I BAREA<<<<  ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH	*********  S CODE = 4 ) <<<<< ======= M(FEET) = T(FEET) =	********* 1159.00
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87	********* 21420.00 AVEL TIM D BOX SI I(FEET) = 4.60 M ) = 19. = 5.00	*********  TO NODE  TE THRU SU  IZE (EXIST  1170.00  MANNING'S  O GIVE  ESTIMA	**********  21421.00 I  BAREA<<<<  ING ELEMENT  DOWNSTREA  N = 0.014  N BOX HEIGH  TED BOX BAS	*********  S CODE = 4  ) <<<<< =======  M(FEET) =  T(FEET) =  EWIDTH(FEET	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET)  *GIVEN BOX HEIGHT(FEET)  ASSUME FULL-FLOWING BOX BOX-FLOW(CFS) = 3079.	******** 21420.00	#*******  TO NODE  TE THRU SU IZE (EXIST  ===================================	********* 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC	*********  S CODE = 4  ) <<<< ========  M(FEET) =  T(FEET) =  EWIDTH (FEET  .) = 18.42	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET)  *GIVEN BOX HEIGHT(FEET)  ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079.  BOX-FLOW TRAVEL TIME (MIN	******** 21420.00	#*******  TO NODE  TE THRU SU IZE (EXIST  ===================================	********* 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) =	*********  S CODE = 4  ) <<<< ========  M(FEET) =  EWIDTH (FEET .) = 18.42  34.55	********* 8  1159.00 5.00 2) = 33.43
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET)  *GIVEN BOX HEIGHT(FEET)  ASSUME FULL-FLOWING BOX BOX-FLOW(CFS) = 3079.	******** 21420.00	#*******  TO NODE  TE THRU SU IZE (EXIST  ===================================	********* 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) =	*********  S CODE = 4  ) <<<< ========  M(FEET) =  EWIDTH (FEET .) = 18.42  34.55	********* 8  1159.00 5.00 2) = 33.43
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET)  *GIVEN BOX HEIGHT(FEET)  ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079.  BOX-FLOW TRAVEL TIME (MIN	******** 21420.00 AVEL TIN D BOX SI ====================================	*********  TO NODE  TE THRU SU  TEE (EXIST  == 1170.00  MANNING'S  .00 GIVE  .0 ESTIMA  LOW VELOCI  .79 TC  .70 TO N	**********  21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) = ODE 21421.	*********  S CODE = 4 ) <<<<< ========= M(FEET) = EWIDTH (FEET .) = 18.42 34.55 00 = 2516	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET  *GIVEN BOX HEIGHT (FEET) ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO	********* 21420.00 AVEL TIN D BOX SI ====================================	*********  TO NODE  TO NODE  TE THRU SU  TEE (EXIST  == 1170.00  MANNING'S  .00 GIVE  .0 ESTIMA  LOW VELOCI  .79 Tc  .00.00 TO N	**********  21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) = ODE 21421.	*********  S CODE = 4 ) <<<< ======== M(FEET) = EWIDTH (FEET .) = 18.42 34.55 00 = 2516 ************	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET *GIVEN BOX HEIGHT (FEET) ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO	********* 21420.00 AVEL TIN D BOX SI (FEET) = 4.60 N ) = 19. = 5.00 BOX-FI 58 .) = ((DE 2110) ******** 21421.00	*********  TO NODE  TO NODE  E THRU SU  IZE (EXIST  = 1170.00  MANNING'S  .00 GIVE  D ESTIMA  LOW VELOCI  0.79 TC  00.00 TO N  **********  TO NODE	**********  21421.00 I  BAREA<<<< ING ELEMENT  DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC  (MIN.) =  ODE 21421.  ***********  21421.00 I	********  S CODE = 4 )<<<<< ========= M(FEET) = EWIDTH(FEET .) = 18.42 34.55 00 = 2516 ********** S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET)  ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO  ***********************************	********* 21420.00 AVEL TIN D BOX SI ====================================	*********  ) TO NODE	********** 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY(FEET/SEC (MIN.) = ODE 21421.  ********** 21421.00 I	*********  S CODE = 4  )<<<<< ==========  M(FEET) =  EWIDTH(FEET .) = 18.42  34.55  00 = 2516  **********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET) *GIVEN BOX HEIGHT (FEET) ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO  ***********************************	******** 21420.00 AVEL TIN D BOX SI ====================================	*********  ) TO NODE	********** 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY(FEET/SEC (MIN.) = ODE 21421.  ********** 21421.00 I	*********  S CODE = 4  )<<<<< ==========  M(FEET) =  EWIDTH(FEET .) = 18.42  34.55  00 = 2516  **********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET) ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO  ***********************************	******** 21420.00 AVEL TIN D BOX SI ((FEET) = 4.60 N ) = 19. = 5.00 BOX-FI 58 (.) = (10 DE 2110 ******* 21421.00 TO MAIN55	*********  ) TO NODE	********** 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY(FEET/SEC (MIN.) = ODE 21421.  ********** 21421.00 I	*********  S CODE = 4  )<<<<< ==========  M(FEET) =  EWIDTH(FEET .) = 18.42  34.55  00 = 2516  **********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH (FEET) = 87 GIVEN BOX BASEWIDTH (FEET) *GIVEN BOX HEIGHT (FEET) ASSUME FULL-FLOWING BOX BOX-FLOW (CFS) = 3079. BOX-FLOW TRAVEL TIME (MIN LONGEST FLOWPATH FROM NO  ***********************************	******** 21420.00 AVEL TIN D BOX SI ====================================	*********  ) TO NODE   ME THRU SU  IZE (EXIST  = 1170.00  MANNING'S  .00 GIVE  ) ESTIMA  LOW VELOCI  0.79 TC  00.00 TO N  *********  ) TO NODE   NLINE PEAK   NCH/HR) =	********** 21421.00 I BAREA<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY(FEET/SEC (MIN.) = ODE 21421.  ********** 21421.00 I	*********  S CODE = 4  )<<<<< ==========  M(FEET) =  EWIDTH(FEET .) = 18.42  34.55  00 = 2516  **********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ==================================	******** 21420.00	#********  TO NODE  TO NODE  TE THRU SU  TEE (EXIST  ===================================	********* 21421.00 I BAREA<<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) = ODE 21421.  ********** 21421.00 I	********  S CODE = 4  ) <<<< ========  M(FEET) =  EWIDTH (FEET) .) = 18.42  34.55 00 = 2516  *********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ==================================	******** 21420.00	#********  TO NODE  TO NODE  TE THRU SU  TEE (EXIST  == 1170.00  #ANNING'S  OO GIVE  OO.00 TO N  *********  OTO NODE  NLINE PEAK  =======  NCH/HR) =  L AREA  (ACRES)	********* 21421.00 I BAREA<<<<< ING ELEMENT BOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC  (MIN.) = DOBE 21421.  ********** 21421.00 I  FLOW<<<<<	********  S CODE = 4 ) <<<< ======== M(FEET) = EWIDTH (FEET) .) = 18.42 34.55 00 = 2516 ********* S CODE = 8 Ap (DECIMAL)	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ==================================	******** 21420.00	#********  TO NODE  TO NODE  TE THRU SU  TEE (EXIST  == 1170.00  #ANNING'S  OO GIVE  OO.00 TO N  *********  OTO NODE  NLINE PEAK  =======  NCH/HR) =  L AREA  (ACRES)	********* 21421.00 I BAREA<<<<< ING ELEMENT BOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC  (MIN.) = DOBE 21421.  ********** 21421.00 I  FLOW<<<<<	********  S CODE = 4  ) <<<< ========  M(FEET) =  EWIDTH (FEET) .) = 18.42  34.55 00 = 2516  *********  S CODE = 8	**************************************
FLOW PROCESS FROM NODE  >>>>>COMPUTE BOX-FLOW TR >>>>>USING USER-SPECIFIE  ELEVATION DATA: UPSTREAM FLOW LENGTH(FEET) = 87 GIVEN BOX BASEWIDTH(FEET) ASSUME FULL-FLOWING BOX BOX-FLOW(CFS) = 3079. BOX-FLOW TRAVEL TIME(MIN LONGEST FLOWPATH FROM NO  ***********************************	******* 21420.00	#********  TO NODE  T	********* 21421.00 I BAREA<<<<< ING ELEMENT DOWNSTREA N = 0.014 N BOX HEIGH TED BOX BAS TY (FEET/SEC (MIN.) = ODE 21421.  ********* 21421.00 I	********  S CODE = 4  )<<<< ========  M(FEET) =  EWIDTH (FEET) .) = 18.42  34.55 00 = 2516  ********  S CODE = 8   Ap (DECIMAL) 0.850	**************************************

```
B 0.87 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 0.17 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
 SUBAREA AREA(ACRES) = 1.89
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.92;1H= 1.21;3H= 1.87;6H= 2.47;24H= 5.03
 S-GRAPH: VALLEY (DEV.) = 97.1%; VALLEY (UNDEV.) / DESERT= 2.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.40; Ybar = 0.45
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2706.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0240; Lca/L=0.4,n=.0215; Lca/L=0.5,n=.0197; Lca/L=0.6,n=.0184
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 661.83
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3031.08
 TOTAL AREA(ACRES) = 2706.4 PEAK FLOW RATE(CFS) = 3079.58
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
************************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21070.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 6262.02 Tc (MIN.) = 53.53
 AREA-AVERAGED Fm(INCH/HR) = 0.50 Ybar = 0.50
 TOTAL AREA(ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 14.0
_______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 6262.02 Tc (MIN.) = 53.53
 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.50
 TOTAL AREA(ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 12
```

```
>>>>CLEAR MEMORY BANK # 2 <<<<
_____
*************************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21421.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1183.00 DOWNSTREAM(FEET) = 1159.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1867.34 CHANNEL SLOPE = 0.0129
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 6262.02
 FLOW VELOCITY (FEET/SEC.) = 29.79 FLOW DEPTH (FEET) = 6.41
 TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 54.57
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 54.57
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.323
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
                                           Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                             51.49
                                     0.75
                                             0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                           5.09
                                     0.75
                                             0.600
                                                  56
                                             0.850
 PUBLIC PARK
                      В
                             3.37
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185
 SUBAREA AREA(ACRES) = 59.95
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.97;6H= 2.70;24H= 6.05
 S-GRAPH: VALLEY(DEV.) = 71.9%; VALLEY(UNDEV.)/DESERT= 28.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.91; LAG(HR) = 0.73; Fm(INCH/HR) = 0.49; Ybar = 0.50
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0241; Lca/L=0.4, n=.0216; Lca/L=0.5, n=.0198; Lca/L=0.6, n=.0185
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2834.74
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 6213.83
 TOTAL AREA(ACRES) = 11083.8
                              PEAK FLOW RATE (CFS) = 6262.02
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 11
```

```
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 6262.02 Tc (MIN.) = 54.57
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.50
 TOTAL AREA (ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 3079.58 Tc (MIN.) = 34.55
 AREA-AVERAGED Fm (INCH/HR) = 0.40 Ybar = 0.45
 TOTAL AREA (ACRES) = 2706.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.95;6H= 2.66;24H= 5.85
 S-GRAPH: VALLEY(DEV.) = 76.8%; VALLEY(UNDEV.)/DESERT= 23.2%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.91; LAG(HR) = 0.73; Fm(INCH/HR) = 0.48; Ybar = 0.49
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13790.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0241; Lca/L=0.4, n=.0216; Lca/L=0.5, n=.0198; Lca/L=0.6, n=.0185
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 3447.87
 PEAK FLOW RATE (CFS) = 7420.39
*******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21422.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1159.00 DOWNSTREAM(FEET) = 1153.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 938.13 CHANNEL SLOPE = 0.0064
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7420.39
 FLOW VELOCITY (FEET/SEC.) = 24.22 FLOW DEPTH (FEET) = 8.35
 TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 55.22
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
*****************
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21422.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0214ZZ.RES Page 19

File name: LR0214ZZ.RES Page 20

```
MAINLINE Tc(MIN.) = 55.22
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.314
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fρ
                                                                                                                           Αp
                                                                                                                                 SCS
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                             Ap SCS
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                                             RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             "3-4 DWELLINGS/ACRE" B
                                                                                                          1.99
                                                                                                                   0.75
                                                                                                                          0.600
     LAND USE
                     В
                                                                                                 В
                                                                                                         11.78
                                                                                                                          0.100
 COMMERCIAL
                              65.40
                                       0.75
                                              0.100
                                                                             COMMERCIAL
                                                                                                                   0.75
                                                                                                                                  56
                                                                                                  В
                                                                                                        4.78
                                                                                                                          0.250
 RESIDENTIAL
                                                                             MOBILE HOME PARK
                                                                                                                   0.75
                                                                                                                                  56
 "3-4 DWELLINGS/ACRE" B 1.90
                                       0.75
                                              0.600
                                                                                                   В
                                                                                                          1.74
                                                                                                                          0.850
                                                                                                                                  56
                                                                             PUBLIC PARK
                                                                                                                   0.75
 RESIDENTIAL
                                                                             RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                    в 4.85
                                       0.75
                                              0.200
                                                     56
                                                                             "11+ DWELLINGS/ACRE" B 0.99
                                                                                                                   0.75
                                                                                                                          0.200
 PUBLIC PARK
                       В
                              2.00
                                       0.75
                                              0.850
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                     B 47.14
                                       0.75 0.400
                                                                             SUBAREA AREA (ACRES) = 21.28
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             UNIT-HYDROGRAPH DATA:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.241
                                                                             RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.95;6H= 2.65;24H= 5.84
                                                                             S-GRAPH: VALLEY (DEV.) = 77.0%; VALLEY (UNDEV.) / DESERT= 23.0%
 SUBAREA AREA (ACRES) = 121.29
 UNIT-HYDROGRAPH DATA:
                                                                                     MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.95;6H= 2.65;24H= 5.84
                                                                             Tc(HR) = 0.93; LAG(HR) = 0.74; Fm(INCH/HR) = 0.47; Ybar = 0.49
 S-GRAPH: VALLEY(DEV.) = 77.0%; VALLEY(UNDEV.) / DESERT = 23.0%
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.47; Ybar = 0.49
                                                                             3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13932.8
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13911.6
                                                                              Lca/L=0.3,n=.0239; Lca/L=0.4,n=.0214; Lca/L=0.5,n=.0197; Lca/L=0.6,n=.0183
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
                                                                             TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 3491.33
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7374.18
  Lca/L=0.3,n=.0240; Lca/L=0.4,n=.0215; Lca/L=0.5,n=.0197; Lca/L=0.6,n=.0184
                                                                             TOTAL AREA (ACRES) = 13932.8 PEAK FLOW RATE (CFS) = 7420.39
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 3484.88
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7414.68
 TOTAL AREA (ACRES) = 13911.6 PEAK FLOW RATE (CFS) = 7420.39
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                             5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                            *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                             FLOW PROCESS FROM NODE 21423.00 TO NODE 21439.00 IS CODE = 54
                                                                            ______
*********************
                                                                             >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21423.00 IS CODE = 54
                                                                             >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
                                                                            ______
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1148.00 DOWNSTREAM(FEET) = 1143.00
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                             CHANNEL LENGTH THRU SUBAREA (FEET) = 702.31 CHANNEL SLOPE = 0.0071
                                                                             CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
______
                                                                             MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 ELEVATION DATA: UPSTREAM(FEET) = 1153.00 DOWNSTREAM(FEET) = 1148.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 670.94 CHANNEL SLOPE = 0.0075
                                                                             CHANNEL FLOW THRU SUBAREA(CFS) = 7420.39
                                                                             FLOW VELOCITY (FEET/SEC.) = 25.18 FLOW DEPTH (FEET) = 8.13
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
                                                                             TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 56.12
 CHANNEL FLOW THRU SUBAREA(CFS) = 7420.39
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
 FLOW VELOCITY (FEET/SEC.) = 25.60 FLOW DEPTH (FEET) = 8.04
                                                                            TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 55.65
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
                                                                             FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 81
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 21423.00 TO NODE 21423.00 IS CODE = 81
                                                                            ______
                                                                             MAINLINE Tc(MIN.) = 56.12
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.301
______
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 MAINLINE Tc(MIN.) = 55.65
                                                                              DEVELOPMENT TYPE/
                                                                                               SCS SOIL AREA
                                                                                                                Fp
                                                                                                                                 SCS
                                                                                                                         Aр
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.308
                                                                                 LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 21

DECT DENET 3 I						HE 7 DURIN THEO / A CDRH	D	0 00	0.75	0 500	F.C	C F2
RESIDENTIAL "3-4 DWELLINGS/ACRE"	В	0.52	0.75	0.600	56	"5-7 DWELLINGS/ACRE" RESIDENTIAL	В	0.20	0.75	0.500	56	6.53
PUBLIC PARK		1.21	0.75	0.850	56	"3-4 DWELLINGS/ACRE"	В	2.38	0.75	0.600	56	6.92
MOBILE HOME PARK		4.21	0.75	0.250	56	COMMERCIAL	В	3.33	0.75	0.100	56	5.10
SCHOOL		0.18	0.75	0.600	56	SUBAREA AVERAGE PERVIO					0.0	0.10
COMMERCIAL	В	0.96	0.75	0.100	56	SUBAREA AVERAGE PERVIO						
RESIDENTIAL						SUBAREA RUNOFF(CFS) =	27.92					
"11+ DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOUS		0.39 Fp(INCH/F	0.75	0.200 75	56	TOTAL AREA (ACRES) =	5.91 E	PEAK FLOW	RATE (CFS)	= 27.9	92	
SUBAREA AVERAGE PERVIOUS		-				SUBAREA AREA-AVERAGED 1	RAINFALL DE	PTH (INCH)	:			
SUBAREA AREA(ACRES) = UNIT-HYDROGRAPH DATA:	7.47					5M = 0.46; 30M = 0.95;	1HR = 1.25	; 3HR = 1	.90; 6HR =	2.48; 24F	HR = 4.	75
RAINFALL(INCH): 5M= 0.44	;30M= 0.90;	1H= 1.19;	3H= 1.95;	6H= 2.65;	24H= 5.84	******	*****	******	******	******	*****	*****
S-GRAPH: VALLEY(DEV.) = 7 MOUNTAIN= 0.0%					5	FLOW PROCESS FROM NODE						
Tc(HR) = 0.94; LAG(HR) =	0.75; Fm(I	NCH/HR) =	0.47; Yb	ar = 0.49	)	>>>>COMPUTE STREET FLO	OW TRAVEL I	IME THRU	SUBAREA<<<	.<<		
USED SIERRA MADRE DEPTH-						>>>> (STREET TABLE SEC		,				
DEPTH-AREA FACTORS: 5M =		= 0.62; 1F	IR = 0.63	3;								
3HR = 0.92; 6HR = 0.96; UNIT-INTERVAL(MIN) = 5.		ADEA (ACDE)	2) – 1	2010 2		UPSTREAM ELEVATION (FEE' STREET LENGTH (FEET) =					) = 120	9.00
LONGEST FLOWPATH FROM NO	DE 20120.00	O TO NODE			041.07 FEET.	STREET HALFWIDTH (FEET)		CURB HEIG	HI (INCHES)	= 0.0		
EQUIVALENT BASIN FACTOR Lca/L=0.3,n=.0238; Lca/			=0 5 n= (	1196•T.ca/T	.=0 6 n= 0183	DISTANCE FROM CROWN TO	CROSSFALL.	GRADERREZ	K(FEET) =	20 00		
TIME OF PEAK FLOW(HR) =	•				0.0,11 .0105	INSIDE STREET CROSSFAL			ш(ппп)	20.00		
UNIT-HYDROGRAPH PEAK FLO			, ,	0130.00		OUTSIDE STREET CROSSFA			20			
TOTAL AREA (ACRES) = 1	. ,			CFS) =	7420.39		,					
NOTE: PEAK FLOW RATE DEF.	'AULTED TO U'	PSTREAM VA	ALUE			SPECIFIED NUMBER OF HA	LFSTREETS C	CARRYING F	RUNOFF = 2			
						STREET PARKWAY CROSSFA	LL(DECIMAL)	= 0.02	20			
SUBAREA AREA-AVERAGED RA	INFALL DEPT	H(INCH):				Manning's FRICTION FAC'	TOR for Str	eetflow S	Section(cur	b-to-curb)	) = 0	.0180
5M = 0.46; 30M = 0.95; 1	HR = 1.25;	3HR = 1.79	); 6HR =	2.25; 24H	4R = 4.75	Manning's FRICTION FAC				ion = 0.	.0200	
*******						MAXIMUM ALLOWABLE STRE	ET FLOW DEF	TH (FEET)	= 1.03			
						++mpayer mine complim	an marke ne	IMINAMED I	TOW/GEG)	40. 1	2.5	
FLOW PROCESS FROM NODE						**TRAVEL TIME COMPUT				42.3	33	
>>>>DESIGNATE INDEPENDE						STREET FLOW DEPTH(FE			) FLOW:			
						HALFSTREET FLOOD WID	,					
TOTAL NUMBER OF STREAMS						AVERAGE FLOW VELOCITY	1 .		0.4			
CONFLUENCE VALUES USED F		ENT STREAM	M 1 ARE:			PRODUCT OF DEPTH&VELO	•	*.				
PEAK FLOW RATE(CFS) =						STREET FLOW TRAVEL TIM				6.28		
AREA-AVERAGED Fm (INCH/HR	(0.47)	Ybar = 0.	.49			* 100 YEAR RAINFALL IN						
TOTAL AREA (ACRES) = 1	.3940.3					SUBAREA LOSS RATE DATA	(AMC II):					
						DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ар	SCS	
******						LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	) CN	
FLOW PROCESS FROM NODE						RESIDENTIAL						
						"5-7 DWELLINGS/ACRE"		0.32	0.75	0.500	56	
>>>>RATIONAL METHOD INI						COMMERCIAL	В	5.86	0.75	0.100	56	
>>USE TIME-OF-CONCENTRAT						RESIDENTIAL						
					========	"3-4 DWELLINGS/ACRE"	В	0.61	0.75	0.600	56	
INITIAL SUBAREA FLOW-LEN				M (DD)	1014 00	SUBAREA AVERAGE PERVIOU		, .		./5		
ELEVATION DATA: UPSTREAM	(FEET) = 1	1220.00 I	JOWNSTREA	M(FEET) =	= 1214.00	SUBAREA AVERAGE PERVIO				10) 00	0.2	
mo - V*[/IENOMII++ 2 00\/	//ETEMAMION .	CHANCE \ 1 4.	*n 2n			SUBAREA AREA (ACRES) =			RUNOFF (CF			10
Tc = K*[(LENGTH** 3.00)/						EFFECTIVE AREA (ACRES) =					) = 0.	ТΩ
* 100 YEAR DATHEATT THE						AREA-AVERAGED Fp(INCH/			-		5.2	33
* 100 YEAR RAINFALL INTE SUBAREA TC AND LOSS RATE			101			TOTAL AREA (ACRES) =	12.1	PEAr	K FLOW RATE	(C15) =	53.	22
	SCS SOIL A	•	Fp	Δn	SCS Tc	SUBAREA AREA-AVERAGED 1	RATMFATT DE	יים (דאורט)				
LAND USE			-	Ap	CN (MIN.)	5M = 0.46; 30M = 0.95;		, ,		: 2 34 2/1	HR = △	75
RESIDENTIAL	OLOGI (AC	O:(10) (11)	· ○ 11/ 111/	(DUCTLIUI)	O14 (LITIA.)	5ri 0.10, 50ri - 0.95,	11111 - 1.20	,, Jiii. — 1	, опп. –	2.51, 241	\ - T.	, 5
1.00 10011 1111												

 Date: 04/21/2014
 File name: LR0214ZZ.RES
 Page 23
 Date: 04/21/2014
 File name: LR0214ZZ.RES

Page 24

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.59
 FLOW VELOCITY (FEET/SEC.) = 4.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.78
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21432.00 = 486.00 FEET.
FLOW PROCESS FROM NODE 21432.00 TO NODE 21433.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1209.00 DOWNSTREAM ELEVATION(FEET) = 1206.00
 STREET LENGTH (FEET) = 254.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 66.27
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 32.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.83
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 7.38
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 4.394
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                             Ар
                                                     SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    в 0.33
                                       0.75
                                              0.500 56
                      B 5.82
 COMMERCIAL
                                       0.75
                                              0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.58
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.163
 SUBAREA AREA (ACRES) = 6.73 SUBAREA RUNOFF (CFS) = 25.88
 EFFECTIVE AREA(ACRES) = 19.43 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.21
 TOTAL AREA(ACRES) = 19.4 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.26; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 34.53
 FLOW VELOCITY (FEET/SEC.) = 3.95 DEPTH*VELOCITY (FT*FT/SEC.) = 2.99
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21433.00 = 740.00 FEET.
FLOW PROCESS FROM NODE 21433.00 TO NODE 21434.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1206.00 DOWNSTREAM ELEVATION(FEET) = 1202.00
 STREET LENGTH (FEET) = 349.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.81
  HALFSTREET FLOOD WIDTH (FEET) = 39.69
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.04
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.27
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 8.82
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.948
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                      SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     в 0.43 0.75
                                               0.500
                                                      56
 COMMERCIAL
                     B 8.62 0.75 0.100
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.86 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.161
 SUBAREA AREA (ACRES) = 9.91 SUBAREA RUNOFF (CFS) = 34.14
 EFFECTIVE AREA(ACRES) = 29.34 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
 TOTAL AREA (ACRES) = 29.3 PEAK FLOW RATE (CFS) = 100.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 41.87
 FLOW VELOCITY (FEET/SEC.) = 4.12 DEPTH*VELOCITY (FT*FT/SEC.) = 3.43
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21434.00 = 1089.00 FEET.
******************
 FLOW PROCESS FROM NODE 21434.00 TO NODE 21435.00 IS CODE = 63
______
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1202.00 DOWNSTREAM ELEVATION(FEET) = 1195.00
 STREET LENGTH (FEET) = 602.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
```

File name: LR0214ZZ.RES

Page 26

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH(FEET) = 0.96
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.13
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 53.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.79
   STREET FLOW DEPTH(FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 47.97
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 14.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.33
                                                                                * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.978
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.86
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA Fp
 STREET FLOW TRAVEL TIME (MIN.) = 2.32 Tc (MIN.) = 11.14
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.432
                                                                                    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 2.44 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                      SCS
                                                                                COMMERCIAL
                                                                                                    B 28.76 0.75 0.100
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                RESIDENTIAL
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.83
                                                                                "5-7 DWELLINGS/ACRE" B 0.28 0.75 0.500
                                     0.75 0.500 56
                     B 16.10 0.75 0.100 56
 COMMERCIAL
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.142
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.38 0.75 0.600 56
                                                                                SUBAREA AREA (ACRES) = 31.48 SUBAREA RUNOFF (CFS) = 81.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                EFFECTIVE AREA(ACRES) = 80.13 AREA-AVERAGED Fm(INCH/HR) = 0.13
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.179
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 SUBAREA AREA(ACRES) = 19.31 SUBAREA RUNOFF(CFS) = 57.33
                                                                                TOTAL AREA (ACRES) = 80.1 PEAK FLOW RATE (CFS) =
 EFFECTIVE AREA(ACRES) = 48.65 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 48.7 PEAK FLOW RATE (CFS) = 144.15
                                                                                5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 55.11
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.15 DEPTH*VELOCITY (FT*FT/SEC.) = 5.09
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 50.94
                                                                                      AND L = 889.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 95.6 CFS,
 FLOW VELOCITY (FEET/SEC.) = 4.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.05
                                                                                      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21436.00
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21436.00 = 2580.50 FEET.
       AND L = 602.0 FT WITH ELEVATION-DROP = 7.0 FT, IS 63.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21435.00
                                                                               *******************
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21435.00 = 1691.00 FEET.
                                                                                FLOW PROCESS FROM NODE 21436.00 TO NODE 21437.00 IS CODE = 33
                                                                               ______
*******************
                                                                                >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 FLOW PROCESS FROM NODE 21435.00 TO NODE 21436.00 IS CODE = 63
                                                                                >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
                                                                               _____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1183.00
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1172.00
______
                                                                                FLOW LENGTH (FEET) = 717.00 MANNING'S N = 0.013
 UPSTREAM ELEVATION(FEET) = 1195.00 DOWNSTREAM ELEVATION(FEET) = 1183.00
 STREET LENGTH (FEET) = 889.50 CURB HEIGHT (INCHES) = 8.0
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
                                                                                DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.8 INCHES
 STREET HALFWIDTH (FEET) = 39.00
                                                                                PIPE-FLOW VELOCITY (FEET/SEC.) = 17.41
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                PIPE-FLOW(CFS) = 205.59
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Page 27

Date: 04/21/2014 File name: LR0214ZZ.RES

\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 14.85Date: 04/21/2014 File name: LR0214ZZ.RES Page 28

0.600

56

56

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.889
                                                                                   COMMERCIAL
                                                                                                          B 35.84 0.75 0.100
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   RESIDENTIAL
                                                                                                       B 5.10 0.75 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                                                   "3-4 DWELLINGS/ACRE"
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 COMMERCIAL
                               22.52 0.75
                                                0.100 56
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.168
 RESIDENTIAL
                                                                                  SUBAREA AREA(ACRES) = 41.22
                                                                                                                SUBAREA RUNOFF (CFS) = 98.15
 "3-4 DWELLINGS/ACRE" B 4.08 0.75 0.600 56
                                                                                  EFFECTIVE AREA(ACRES) = 147.95 AREA-AVERAGED Fm(INCH/HR) = 0.13
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.177
                                                                                   TOTAL AREA (ACRES) = 147.9 PEAK FLOW RATE (CFS) = 351.97
 SUBAREA AREA (ACRES) = 26.60 SUBAREA RUNOFF (CFS) = 65.99
 EFFECTIVE AREA(ACRES) = 106.73 AREA-AVERAGED Fm(INCH/HR) = 0.13
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 TOTAL AREA (ACRES) = 106.7
                               PEAK FLOW RATE(CFS) =
                                                                                  STREET CROSS-SECTION INFORMATION:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  CURB HEIGHT (INCHES) = 8.0
                                                                                                              STREET HALFWIDTH (FEET) = 39.00
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET CROSS-SECTION INFORMATION:
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 39.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.80
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREET FLOW DEPTH (FEET) = 0.77
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 36.09
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 59.59
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.37
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.38
                                                                                  LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21438.00 = 4358.50 FEET.
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.19
                                                                                 ******************
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86
                                                                                   FLOW PROCESS FROM NODE 21438.00 TO NODE 21439.00 IS CODE = 33
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21437.00 = 3297.50 FEET.
                                                                                  >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
*********************
                                                                                  >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 FLOW PROCESS FROM NODE 21437.00 TO NODE 21438.00 IS CODE = 33
                                                                                 _____
______
                                                                                   UPSTREAM NODE ELEVATION (FEET) = 1157.00
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                  DOWNSTREAM NODE ELEVATION (FEET) = 1143.00
                                                                                  FLOW LENGTH (FEET) = 895.00 MANNING'S N = 0.013
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1172.00
                                                                                  USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DOWNSTREAM NODE ELEVATION (FEET) = 1157.00
                                                                                  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 FLOW LENGTH (FEET) = 1061.00 MANNING'S N = 0.013
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 15.28
                                                                                  PIPE-FLOW(CFS) = 300.37
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 16.90
                                                                                  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.673
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 42.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.72
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 PIPE-FLOW(CFS) = 265.17
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                   αA
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       LAND USE
 PIPEFLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 15.92
                                                                                  AGRICULTURAL FAIR COVER
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.771
                                                                                  "ORCHARDS"
                                                                                                          В
                                                                                                                0.33
                                                                                                                           0.63
                                                                                                                                  1.000
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                          В
                                                                                                                21.36
                                                                                                                           0.75
                                                                                                                                   0.100
                                                                                  COMMERCIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  αA
                                                        SCS
                                                                                  RESIDENTIAL
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                          В 3.94
                                                                                                                           0.75 0.600
     LAND USE
 AGRICULTURAL FAIR COVER
                                                                                  MOBILE HOME PARK
                                                                                                          В
                                                                                                                2.98
                                                                                                                           0.75
                                                                                                                                  0.250
 "ORCHARDS"
                                0.28
                                         0.63
                                                1.000 65
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 29 File name: LR0214ZZ.RES Page 30

Date: 04/21/2014

56

56

SCS

65

56

56

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.195
 SUBAREA AREA(ACRES) = 28.61
                                SUBAREA RUNOFF (CFS) = 65.12
 EFFECTIVE AREA(ACRES) = 176.56 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 176.6 PEAK FLOW RATE (CFS) = 404.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 103.79
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 39.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.77
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21439.00 = 5253.50 FEET.
******************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 16.90
 RAINFALL INTENSITY (INCH/HR) = 2.67
 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.17
 EFFECTIVE STREAM AREA(ACRES) = 176.56
 TOTAL STREAM AREA(ACRES) = 176.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 404.16
 ** CONFLUENCE DATA **
 STREAM O Tc
                         AREA
                                   HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
          7420.39 56.12 13940.30 20120.00
   1
          404.16 16.90
                         176.56
                                    21430.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.94;6H= 2.65;24H= 5.83
 S-GRAPH: VALLEY (DEV.) = 77.3%; VALLEY (UNDEV.) / DESERT= 22.7%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.94; LAG(HR) = 0.75; Fm(INCH/HR) = 0.47; Ybar = 0.49
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
```

```
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14116.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0238; Lca/L=0.4,n=.0213; Lca/L=0.5,n=.0196; Lca/L=0.6,n=.0183
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 3550.95
 PEAK FLOW RATE (CFS) = 7417.01
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 7420.39)
 PEAK FLOW RATE (CFS) USED = 7420.39
*******************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21443.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1143.00 DOWNSTREAM(FEET) = 1135.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1468.88 CHANNEL SLOPE = 0.0054
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7420.39
 FLOW VELOCITY (FEET/SEC.) = 22.83 FLOW DEPTH (FEET) = 8.69
 TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 57.19
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
******************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 7420.39 Tc (MIN.) = 57.19
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.49
 TOTAL AREA(ACRES) = 14116.9
*******************
 FLOW PROCESS FROM NODE 21440.00 TO NODE 21441.00 IS CODE = 21
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 665.71
 ELEVATION DATA: UPSTREAM(FEET) = 1142.00 DOWNSTREAM(FEET) = 1138.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.261
 SUBAREA TC AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
    LAND USE
                   В
                        6.41
                                           0.250
                                                  56 12.59
 MOBILE HOME PARK
                                    0.75
 PUBLIC PARK
                    В
                          0.38
                                    0.75
                                           0.850
                                                 56 18.09
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   в 0.07
                                    0.75
                                           0.600
                                                  56 15.43
                     В
                            0.09
                                    0.75
                                           0.600
                                                 56 15.43
 SCHOOL
 RESIDENTIAL.
 "11+ DWELLINGS/ACRE"
                            0.25
                                    0.75
                                           0.200
                                                56 12.14
      Date: 04/21/2014
                    File name: LR0214ZZ.RES
                                                Page 32
```

3HR = 0.92; 6HR = 0.96; 24HR = 0.98

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.288
 SUBAREA RUNOFF (CFS) = 19.74
 TOTAL AREA(ACRES) = 7.20 PEAK FLOW RATE(CFS) = 19.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
********************
 FLOW PROCESS FROM NODE 21441.00 TO NODE 21442.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1138.00 DOWNSTREAM ELEVATION(FEET) = 1136.00
 STREET LENGTH (FEET) = 701.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 29.12
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 STREET FLOW TRAVEL TIME (MIN.) = 5.26 Tc (MIN.) = 17.40
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.627
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 PUBLIC PARK
                      В
                               1.22
                                       0.75
                                                 0.850 56
                       В 16.66
                                                 0.250 56
 MOBILE HOME PARK
                                         0.75
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                     B 0.05
                                       0.75
                                                 0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.291
 SUBAREA AREA (ACRES) = 17.93 SUBAREA RUNOFF (CFS) = 38.89
 EFFECTIVE AREA(ACRES) = 25.13 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.29
 TOTAL AREA (ACRES) = 25.1 PEAK FLOW RATE (CFS) = 54.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.80 HALFSTREET FLOOD WIDTH (FEET) = 33.09
 FLOW VELOCITY (FEET/SEC.) = 2.41 DEPTH*VELOCITY (FT*FT/SEC.) = 1.93
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
```

```
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21442.00
 LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21442.00 = 1366.81 FEET.
*****************
 FLOW PROCESS FROM NODE 21442.00 TO NODE 21443.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1136.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1135.00
 FLOW LENGTH (FEET) = 150.38 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 26.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.04
 PIPE-FLOW(CFS) =
                    54.52
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 17.68
 LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21443.00 = 1517.19 FEET.
******************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.68
 RAINFALL INTENSITY (INCH/HR) = 2.60
 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.29
 EFFECTIVE STREAM AREA(ACRES) = 25.13
 TOTAL STREAM AREA(ACRES) = 25.13
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 54.52
 ** CONFLUENCE DATA **
 STREAM O
                       AREA HEADWATER
                 Tc
 NUMBER (CFS) (MIN.) (ACRES) NODE
  1 7420.39 57.19 14116.86 20120.00
  2 54.52 17.68 25.13 21440.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.94;6H= 2.65;24H= 5.82
 S-GRAPH: VALLEY(DEV.) = 77.4%; VALLEY(UNDEV.)/DESERT= 22.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.95; LAG(HR) = 0.76; Fm(INCH/HR) = 0.47; Ybar = 0.49
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14142.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0236; Lca/L=0.4, n=.0212; Lca/L=0.5, n=.0194; Lca/L=0.6, n=.0181
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3558.20
```

File name: LR0214ZZ.RES

Page 34

Date: 04/21/2014

AND L = 701.1 FT WITH ELEVATION-DROP = 2.0 FT, IS 44.0 CFS,

```
PEAK FLOW RATE (CFS) = 7433.87
******************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21453.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1135.00 DOWNSTREAM(FEET) = 1118.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1571.70 CHANNEL SLOPE = 0.0108
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7433.87
 FLOW VELOCITY (FEET/SEC.) = 29.35 FLOW DEPTH (FEET) = 7.31
 TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 58.08
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 7433.87 Tc (MIN.) = 58.08
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.49
 TOTAL AREA(ACRES) = 14142.0
******************
 FLOW PROCESS FROM NODE 21450.00 TO NODE 21451.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 526.00
 ELEVATION DATA: UPSTREAM(FEET) = 1132.00 DOWNSTREAM(FEET) = 1128.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.927
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.473
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                Fp Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 MOBILE HOME PARK
                   в 3.07
                                  0.75 0.250 56 10.93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250
 SUBAREA RUNOFF (CFS) = 9.08
 TOTAL AREA (ACRES) = 3.07 PEAK FLOW RATE (CFS) =
                                             9.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*****************
 FLOW PROCESS FROM NODE 21451.00 TO NODE 21452.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 1128.00
```

```
DOWNSTREAM NODE ELEVATION (FEET) = 1119.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 853.42
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.909
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                              0.02 0.75
                                                 0.900
                                                         56
 MOBILE HOME PARK
                      B 18.33 0.75
                                                 0.250
                                                         56
                       В
                             0.30
                                                 0.850
                                                         56
 PUBLIC PARK
                                         0.75
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.28 0.75 0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.259
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.74
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.79
 AVERAGE FLOW DEPTH (FEET) = 0.69 FLOOD WIDTH (FEET) = 42.65
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.75 Tc (MIN.) = 14.68
 SUBAREA AREA(ACRES) = 18.93 SUBAREA RUNOFF(CFS) = 46.26
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
 TOTAL AREA(ACRES) = 22.0
                                PEAK FLOW RATE(CFS) =
                                                           53.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.78 FLOOD WIDTH (FEET) = 53.56
 FLOW VELOCITY (FEET/SEC.) = 4.19 DEPTH*VELOCITY (FT*FT/SEC) = 3.27
 LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21452.00 = 1379.42 FEET.
******************
 FLOW PROCESS FROM NODE 21452.00 TO NODE 21453.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1119.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1118.00
 FLOW LENGTH (FEET) = 197.38 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.19
 PIPE-FLOW(CFS) =
                   43.77
 PIPEFLOW TRAVEL TIME (MIN.) = 0.53 Tc(MIN.) = 15.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.848
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                     Fр
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 36

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
 TOTAL AREA (ACRES) =
                     22.0
                                PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 10.01
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.81
 LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21453.00 = 1576.80 FEET.
FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.21
 RAINFALL INTENSITY (INCH/HR) = 2.85
 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.26
 EFFECTIVE STREAM AREA(ACRES) = 22.00
 TOTAL STREAM AREA(ACRES) = 22.00
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                   53.78
 ** CONFLUENCE DATA **
 STREAM O Tc
                        AREA
                                    HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                     NODE
   1 7433.87 58.08 14141.99 20120.00
          53.78 15.21 22.00 21450.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.94;6H= 2.65;24H= 5.82
 S-GRAPH: VALLEY(DEV.) = 77.4%; VALLEY(UNDEV.)/DESERT= 22.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.97; LAG(HR) = 0.77; Fm(INCH/HR) = 0.47; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14164.0
```

```
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0234; Lca/L=0.4,n=.0209; Lca/L=0.5,n=.0192; Lca/L=0.6,n=.0179
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3564.76
 PEAK FLOW RATE (CFS) = 7449.45
******************
 FLOW PROCESS FROM NODE 21453.00 TO NODE 21469.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1118.00 DOWNSTREAM(FEET) = 1117.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 519.47 CHANNEL SLOPE = 0.0019
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 7449.45
 FLOW VELOCITY (FEET/SEC.) = 15.54 FLOW DEPTH (FEET) = 10.93
 TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 58.64
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
******************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 7449.45 Tc (MIN.) = 58.64
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.48
 TOTAL AREA(ACRES) = 14164.0
******************
 FLOW PROCESS FROM NODE 21460.00 TO NODE 21461.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 626.73
 ELEVATION DATA: UPSTREAM(FEET) = 1222.00 DOWNSTREAM(FEET) = 1219.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.633
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.345
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS Tc
                                    Fρ
                                            Дp
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.48
                                     0.75
                                           0.600 56 15.77
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    в 5.98
                                     0.75
                                            0.500 56 14.89
                      В
 COMMERCIAL
                             1.53
                                     0.75 0.100
                                                   56 11.63
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.464
 SUBAREA RUNOFF(CFS) = 26.96
 TOTAL AREA(ACRES) = 9.99 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
      Date: 04/21/2014
                     File name: LR0214ZZ.RES
```

Page 38

Date: 04/21/2014 Page 37 File name: LR021477.RFS

CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50 CHANNEL FLOW THRU SUBAREA (CFS) = 38.50 FLOW VELOCITY (FEET/SEC.) = 9.79 FLOW DEPTH (FEET) = 0.99 TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 14.88LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21463.00 = 1374.02 FEET. \* FLOW PROCESS FROM NODE 21463.00 TO NODE 21463.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< MAINLINE Tc(MIN.) = 14.88\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.886 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр SCS Дp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.34 0.75 0.600 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" B 8.08 0.75 0.500 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.504 SUBAREA AREA (ACRES) = 8.42 SUBAREA RUNOFF (CFS) = 19.01 EFFECTIVE AREA(ACRES) = 24.97 AREA-AVERAGED Fm(INCH/HR) = 0.36 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49 TOTAL AREA (ACRES) = 25.0 PEAK FLOW RATE(CFS) = 56.69 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.99; 6HR = 2.67; 24HR = 4.75 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21463.00 TO NODE 21464.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1211.00 DOWNSTREAM(FEET) = 1205.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 384.00 CHANNEL SLOPE = 0.0156 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50 CHANNEL FLOW THRU SUBAREA(CFS) = 56.69 FLOW VELOCITY (FEET/SEC.) = 10.12 FLOW DEPTH (FEET) = 1.25 TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 15.51LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21464.00 = 1758.02 FEET. FLOW PROCESS FROM NODE 21464.00 TO NODE 2164.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_\_

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

\_\_\_\_\_

ELEVATION DATA: UPSTREAM(FEET) = 1216.00 DOWNSTREAM(FEET) = 1211.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.66 CHANNEL SLOPE = 0.0186

Date: 04/21/2014 File name: LR0214ZZ.RES Page 39 File name: LR0214ZZ.RES

MAINLINE Tc(MIN.) = 15.51

Date: 04/21/2014

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.815

Page 40

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                             Αp
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                           6.76
                                   0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA(ACRES) = 6.76
                             SUBAREA RUNOFF (CFS) = 14.85
 EFFECTIVE AREA(ACRES) = 31.73 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 31.7
                            PEAK FLOW RATE(CFS) =
                                                    69.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.89; 6HR = 2.45; 24HR = 4.75
*******************
 FLOW PROCESS FROM NODE 21464.00 TO NODE 21465.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1205.00 DOWNSTREAM(FEET) = 1197.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 540.00 CHANNEL SLOPE = 0.0148
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             69.94
 FLOW VELOCITY (FEET/SEC.) = 10.49 FLOW DEPTH (FEET) = 1.39
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 16.37
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21465.00 = 2298.02 FEET.
******************
 FLOW PROCESS FROM NODE 21465.00 TO NODE 21465.00 IS CODE = 81
-----
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 16.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.725
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fρ
                                            αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                           0.08 0.75 0.100 56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 7.60 0.75
                                          0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.496
 SUBAREA AREA(ACRES) = 7.68
                            SUBAREA RUNOFF (CFS) = 16.27
 EFFECTIVE AREA(ACRES) = 39.41 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA(ACRES) = 39.4 PEAK FLOW RATE(CFS) =
                                                    83.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.26; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21465.00 TO NODE 21466.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1197.00 DOWNSTREAM(FEET) = 1187.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 678.50 CHANNEL SLOPE = 0.0147
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             83.66
 FLOW VELOCITY (FEET/SEC.) = 10.97 FLOW DEPTH (FEET) = 1.52
 TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 17.40
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21466.00 = 2976.52 FEET.
*****************
 FLOW PROCESS FROM NODE 21466.00 TO NODE 21466.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 17.40
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.627
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    B 0.26
                                     0.75
                                            0.100
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 8.00
                                    0.75
                                            0.500
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 0.11
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.489
 SUBAREA AREA (ACRES) = 8.37 SUBAREA RUNOFF (CFS) = 17.04
 EFFECTIVE AREA(ACRES) = 47.78 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 47.8 PEAK FLOW RATE (CFS) = 97.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21466.00 TO NODE 21467.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1187.00 DOWNSTREAM(FEET) = 1170.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1180.01 CHANNEL SLOPE = 0.0144
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             97.22
 FLOW VELOCITY (FEET/SEC.) = 11.28 FLOW DEPTH (FEET) = 1.64
 TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 19.14
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21467.00 = 4156.53 FEFT.
******************
 FLOW PROCESS FROM NODE 21467.00 TO NODE 21467.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 19.14
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.481
 SUBAREA LOSS RATE DATA (AMC II):
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0214ZZ.RES Page 41

File name: LR0214ZZ.RES Page 42

```
DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                       Fρ
                                                      SCS
                                                Aр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      В
                               7.62
                                        0.75
                                               0.500
                                                       56
 AGRICULTURAL FAIR COVER
                                               1.000
 "ORCHARDS"
                        В
                               1.76
                                        0.63
                                                      65
 COMMERCIAL
                        В
                               2.13
                                        0.75
                                               0.100
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                               0.15
                                        0.75
                                               0.600
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.504
 SUBAREA AREA(ACRES) = 11.66
                              SUBAREA RUNOFF (CFS) = 22.27
 EFFECTIVE AREA(ACRES) = 59.44 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) =
                    59.4
                               PEAK FLOW RATE(CFS) =
                                                    113.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
********************
 FLOW PROCESS FROM NODE 21467.00 TO NODE 21468.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1170.00 DOWNSTREAM(FEET) = 1156.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1415.51 CHANNEL SLOPE = 0.0099
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              113.20
 FLOW VELOCITY (FEET/SEC.) = 10.18 FLOW DEPTH (FEET) = 1.91
 TRAVEL TIME (MIN.) = 2.32 Tc (MIN.) = 21.46
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21468.00 = 5572.04 FEET.
*******************
 FLOW PROCESS FROM NODE 21468.00 TO NODE 21468.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.46
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.316
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                      SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                       56
 COMMERCIAL
                        В
                               0.73
                                        0.75
                                               0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             0.64
                                        0.75
                                               0.600
                                                       56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                        В
                              11.78
                                        0.75
                                               0.500
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                               2.68
                                        0.63
                                              1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.570
 SUBAREA AREA(ACRES) = 15.83
                               SUBAREA RUNOFF (CFS) = 27.21
 EFFECTIVE AREA(ACRES) = 75.27 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.51
 TOTAL AREA (ACRES) =
                       75.3
                              PEAK FLOW RATE (CFS) = 131.61
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21468.00 TO NODE 21469.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1156.00 DOWNSTREAM(FEET) = 1117.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3195.53 CHANNEL SLOPE = 0.0122
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) = 131.61
 FLOW VELOCITY (FEET/SEC.) = 11.46 FLOW DEPTH (FEET) = 1.95
 TRAVEL TIME (MIN.) = 4.65 Tc (MIN.) = 26.11
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21469.00 = 8767.57 FEET.
******************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 26.11
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.059
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fρ
                                            Αp
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                                                   56
                      В
                            8.14
                                    0.75
                                           0.100
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      В
                                                   65
                             7.28
                                     0.63
                                           1.000
                      В
                             6.06
                                     0.75
                                           0.850
                                                   56
 PUBLIC PARK
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      В
                             3.35
                                     0.75
                                            0.500
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             0.97
                                     0.75
                                           0.600
                                                   56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                            0.23
                                    0.75
                                           0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA(ACRES) = 26.03
                           SUBAREA RUNOFF(CFS) = 38.44
 EFFECTIVE AREA(ACRES) = 101.30 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) =
                  101.3
                             PEAK FLOW RATE (CFS) =
                                                  152.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.11
 RAINFALL INTENSITY (INCH/HR) = 2.06
```

File name: LR021477.RFS

Page 44

Date: 04/21/2014

```
AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) = 101.30
 TOTAL STREAM AREA(ACRES) = 101.30
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                152.64
 ** CONFLUENCE DATA **
 STREAM
         O Tc
                       AREA
                                HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                 NODE
   1 7449.45 58.64 14163.99 20120.00
         152.64 26.11 101.30 21460.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.19;3H= 1.94;6H= 2.64;24H= 5.82
 S-GRAPH: VALLEY (DEV.) = 77.5%; VALLEY (UNDEV.) / DESERT= 22.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.98; LAG(HR) = 0.78; Fm(INCH/HR) = 0.47; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14265.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0234; Lca/L=0.4,n=.0210; Lca/L=0.5,n=.0193; Lca/L=0.6,n=.0180
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3586.59
 PEAK FLOW RATE (CFS) = 7472.38
*****************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21470.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1117.00 DOWNSTREAM(FEET) = 1110.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 370.28 CHANNEL SLOPE = 0.0189
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7472.38
 FLOW VELOCITY (FEET/SEC.) = 35.69 FLOW DEPTH (FEET) = 6.12
 TRAVEL TIME (MIN.) = 0.17 Tc (MIN.) = 58.81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21470.00 = 55971.39 FEET.
******************
 FLOW PROCESS FROM NODE 21470.00 TO NODE 21471.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 58.81
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.265
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            αA
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   В 17.62
                                     0.75
                                             0.500
                                                  56
                     в 0.37
                                   0.75
                                             0.100
                                                    56
 COMMERCIAL
 PUBLIC PARK
                      В
                             0.37
                                     0.75
                                             0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

File name: LR0214ZZ.RES

Page 45

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.499
 SUBAREA AREA(ACRES) = 18.36
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.19;3H= 1.94;6H= 2.64;24H= 5.81
 S-GRAPH: VALLEY(DEV.) = 77.5%; VALLEY(UNDEV.) / DESERT = 22.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.98; LAG(HR) = 0.78; Fm(INCH/HR) = 0.47; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14283.7
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21471.00 = 55971.39 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0233; Lca/L=0.4, n=.0209; Lca/L=0.5, n=.0192; Lca/L=0.6, n=.0179
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3590.63
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7471.90
 TOTAL AREA(ACRES) = 14283.7 PEAK FLOW RATE(CFS) = 7472.38
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21470.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 14283.7 TC (MIN.) =
                                         58.81
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.48
 PEAK FLOW RATE (CFS) = 7472.38
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21586

\* 100-YR HC ULTIMATE CONDITION OCT 2013 IESCOBAR

FILE NAME: LR0215ZZ.DAT

TIME/DATE OF STUDY: 14:17 02/28/2014

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 15.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 1 18 26.0 1 19 52.0 2	10.0 0.	222/2 222/2					
19 52.0 2	15.0 0.	020/0.020/0.	.020 .020	0.50 0.67	1.50 0.031 2.00 0.031	2 0.125	0.0180 0.0180
25 02.0	20.0 0.	020/0.020/0.	.020	0.67	2.00 0.031	2 0.167	0.0180
as (Maxim	Flow-Dept num Allowa (Velocity) TH A FLOW THE UPSTRE	ch = 0.20 FF able Street F Constraint CAPACITY GRE EAM TRIBUTARY	EET Flow De = 6.0 EATER T Y PIPE.	(FT*FT/ HAN *	S)		
UNIT-HYDROGRAE	DH MODET. 9	SELECTIONS / DZ	A D A METE	pç.			
WATERSHED LA			AIVAPIE I E	1.0.			
		PED" S-GRAPI					
		; AND "VALLE			-GRAPH		
		2 UNITS/ACRE NTERED ON SUB					
		REA FACTORS (		ASIS.			
*ANTECEDENT MOI				SUMED FO	R UNIT HYD	ROGRAPH	METHOD*
*****							******
FLOW PROCESS E					0 IS CODE	= 21	
>>>>RATIONAL					 <		
>>USE TIME-OF-							
=======================================						.=======	======
	rH** 3.00)	/(ELEVATION	CHANGE	11**0 20			
Tc = K*[(LENGT SUBAREA ANALYS * 100 YEAR RAI SUBAREA TC ANI DEVELOPMENT T	SIS USED N INFALL INT D LOSS RAT	MINIMUM Tc(M) TENSITY(INCH) TE DATA(AMC	IN.) = /HR) = II):	15.536 2.812		SCS	Тc
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT T	SIS USED N INFALL INT D LOSS RAT IYPE/	MINIMUM TC(MI TENSITY(INCH) TE DATA(AMC SCS SOIL	IN.) = /HR) = II): AREA	15.536 2.812 Fp	Ap	SCS NAL) CN	Tc (MIN.)
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT T	SIS USED N INFALL INT D LOSS RAT IYPE/	MINIMUM TC (MI TENSITY (INCH) TE DATA (AMC SCS SOIL GROUP (A	IN.) = /HR) = II): AREA ACRES)	15.536 2.812 Fp (INCH/H	Ap	IAL) CN	(MIN.)
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT I LAND USE COMMERCIAL RESIDENTIAL	SIS USED N INFALL INT D LOSS RAT IYPE/	MINIMUM TC (MI PENSITY (INCH/ PE DATA (AMC SCS SOIL GROUP (A	IN.) = /HR) = II): AREA ACRES) 9.85	15.536 2.812 Fp (INCH/H 0.7	Ap R) (DECIM 5 0.10	IAL) CN 10 56	(MIN.) 15.54
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT I LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAGE	SIS USED NINFALL INTO LOSS RATIFYPE/ S/ACRE" GE PERVIOU	MINIMUM TC (MI TENSITY (INCH/ TE DATA (AMC SCS SOIL GROUP (A B B US LOSS RATE,	IN.) = /HR) = II): AREA ACRES) 9.85 0.49 , Fp(IN	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) =	Ap R) (DECIM 5 0.10 5 0.50 0.75	IAL) CN 10 56	(MIN.) 15.54
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT I LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC	SIS USED N INFALL INT D LOSS RAT TYPE/ S/ACRE" GE PERVIOU GE PERVIOU	MINIMUM TC (MI TENSITY (INCH/ TE DATA (AMC SCS SOIL GROUP (A B B US LOSS RATE, US AREA FRACT	IN.) = /HR) = II): AREA ACRES) 9.85 0.49 , Fp(IN	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) =	Ap R) (DECIM 5 0.10 5 0.50 0.75	IAL) CN 10 56	(MIN.) 15.54
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TO ANI DEVELOPMENT I LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAGE	SIS USED NINFALL INTO LOSS RATELYPE/ S/ACRE" GE PERVIOUSE PERVIOUSE (CFS) =	MINIMUM TC (MI TENSITY (INCH/ TE DATA (AMC SCS SOIL GROUP (I B B US LOSS RATE, SS AREA FRACT 25.34	IN.) = /HR) = II): AREA ACRES) 9.85 0.49 , Fp(IN	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) = p = 0.1	Ap R) (DECIM 5 0.10 5 0.50 0.75	IAL) CN 10 56	(MIN.) 15.54
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TC ANI DEVELOPMENT T LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF	SIS USED NINFALL INTO LOSS RATELYPE/ SACRE" GE PERVIOUGE	MINIMUM TC (MI TENSITY (INCH/ TE DATA (AMC SCS SOIL GROUP (I B  US LOSS RATE, JS AREA FRACT 25.34 10.34 PEI RAINFALL DEPT	IN.) = /HR) = II): AREA ACRES) 9.85 0.49 FP(IN FION, A AK FLOW	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) = p = 0.1 RATE (CF	Ap R) (DECIM 5 0.10 5 0.50 0.75 19 S) = 2	IAL) CN 56 0 56 56 55.34	(MIN.) 15.54 19.88
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TC ANI DEVELOPMENT TO LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF TOTAL AREA (ACF	SIS USED MINFALL INTO LOSS RATE  SACRE  GE PERVIOU  F(CFS) =  RES) =  AVERAGED F  M = 0.95;	MINIMUM TC (MI TENSITY (INCH, TE DATA (AMC SCS SOIL GROUP (F B  US LOSS RATE, 25.34 10.34 PEF  RAINFALL DEPT 1HR = 1.25;	IN.) = /HR) = II): AREA ACRES) 9.85  0.49 Fp(IN FION, A AK FLOW FH (INCH 3HR =	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) = p = 0.1 RATE(CF ): 1.79; 6H	Ap (DECIM 5 0.10 5 0.50 0.75 19 S) = 2 R = 2.25;	IAL) CN 56 0 56 56 55.34 24HR = 4	(MIN.) 15.54 19.88
SUBAREA ANALYS * 100 YEAR RAI SUBAREA TC AND DEVELOPMENT TO LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF TOTAL AREA (ACF SUBAREA AREA-7 5M = 0.46; 30M	SIS USED NINFALL INTO LOSS RATE GE PERVIOUS GE PERVIOUS F(CFS) = RES) = AVERAGED F M = 0.95;	MINIMUM TC (MI PENSITY (INCH/ PE DATA (AMC SCS SOIL GROUP (F B  US LOSS RATE, 25.34 10.34 PEF  RAINFALL DEPT 1HR = 1.25;	IN.) = (/HR) = II): AREA ACRES) 9.85 0.49 Fp(IN FION, A AK FLOW FH (INCH 3HR = ***********************************	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) = p = 0.1 RATE (CF ): 1.79; 6H	Ap (DECIM 5 0.10 0.75 19 S) = 2 R = 2.25;	NAL) CN 56 56 56 56 56 56 56 56 56 56 56 56 56	(MIN.) 15.54 19.88
SUBAREA ANALYS * 100 YEAR RAJ SUBAREA TC ANI DEVELOPMENT TANI LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF TOTAL AREA (ACF SUBAREA AREA-7 5M = 0.46; 30N	SIS USED NINFALL INTO LOSS RATIFEE SACRE"  GACRE"  GE PERVIOU  F(CFS) =  RES) =  AVERAGED F  M = 0.95;  ***********************************	MINIMUM TC (MI PENSITY (INCH) PE DATA (AMC SCS SOIL GROUP (F B  US LOSS RATE, 25.34 10.34 PEF  RAINFALL DEPT 1HR = 1.25;	IN.) = /HR) = II): AREA ACRES) 9.85  0.49 Fp(IN FION, A AK FLOW FH (INCH 3HR = ******* O NODE	15.536 2.812 Fp (INCH/H 0.7 0.7 CH/HR) = p = 0.1 RATE (CF 1.79; 6H ******** 21502.0	Ap R) (DECIM 5 0.10 5 0.50 0.75 19 S) = 2 R = 2.25; ************ 0 IS CODE	MAL) CN 56 56 56 56 56 56 56 56 56 56 56 56 56	(MIN.) 15.54 19.88
SUBAREA ANALYS * 100 YEAR RAJ SUBAREA TC ANI DEVELOPMENT TANI LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF TOTAL AREA (ACF SUBAREA AREA-F 5M = 0.46; 30N ****************** FLOW PROCESS F	SIS USED NINFALL INTO LOSS RATEYPE/  S/ACRE" GE PERVIOU F(CFS) = RES) =  AVERAGED F M = 0.95;  ***********************************	MINIMUM TC (MI PENSITY (INCH) PE DATA (AMC SCS SOIL GROUP (F B US LOSS RATE, 25.34 10.34 PEF ARAINFALL DEPT 1HR = 1.25; ************* 21501.00 TC	IN.) = (/HR) = II): AREA ACRES) 9.85 0.49 FP(IN FION, A AK FLOW FH (INCH 3HR = ******* O NODE T TIME	15.536 2.812  Fp (INCH/H 0.7  0.7  CH/HR) = p = 0.1  RATE(CF ): 1.79; 6H  ******* 21502.0  THRU SUB	Ap R) (DECIM 5 0.10 5 0.50 0.75 19 S) = 2 R = 2.25; *********** 0 IS CODE	MAL) CN 56 56 56 56 56 56 56 56 56 56 56 56 56	(MIN.) 15.54 19.88
SUBAREA ANALYS * 100 YEAR RAJ SUBAREA TC ANI DEVELOPMENT TANI LAND USE COMMERCIAL RESIDENTIAL "5-7 DWELLINGS SUBAREA AVERAC SUBAREA AVERAC SUBAREA RUNOFF TOTAL AREA (ACF SUBAREA AREA-7 5M = 0.46; 30N	SIS USED MINFALL INTO LOSS RATELYPE/  SACRE" GE PERVIOUSE PERVIOUS	MINIMUM TC (MI PENSITY (INCH/ PE DATA (AMC SCS SOIL GROUP (I B  US LOSS RATE, JS AREA FRACT 25.34 10.34 PEI ARAINFALL DEPT 1HR = 1.25;  ***********************************	IN.) = (/HR) = II): AREA ACRES) 9.85 0.49 Fp(IN FION, A AK FLOW PH(INCH 3HR = TIME 1127.00 1123. = 598 GUTTER	15.536 2.812  Fp (INCH/H 0.7  0.7  CH/HR) = p = 0.1  RATE(CF ): 1.79; 6H  ******* 21502.0  THRU SUB =======  00 .48 HIKE(FEE	Ap R) (DECIM 5 0.10 5 0.50 0.75 19 S) = 2 R = 2.25; *********** 0 IS CODE AREA<<<<< ================================	MAL) CN 56 10 56 10 56 10 56 10 56 10 10 10 10 10 10 10 10 10 10 10 10 10	(MIN.) 15.54 19.88

```
PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.524
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                      Fρ
                                              Αp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                              9.33
                                      0.75
                                              0.100
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.97
                                      0.75
                                              0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.138
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.25
 AVERAGE FLOW DEPTH (FEET) = 0.75 FLOOD WIDTH (FEET) = 49.97
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.07 Tc (MIN.) = 18.60
 SUBAREA AREA(ACRES) = 10.30
                              SUBAREA RUNOFF(CFS) = 22.44
 EFFECTIVE AREA(ACRES) = 20.64 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.13
 TOTAL AREA(ACRES) = 20.6 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.79 FLOOD WIDTH (FEET) = 54.60
 FLOW VELOCITY (FEET/SEC.) = 3.39 DEPTH*VELOCITY (FT*FT/SEC) = 2.67
 LONGEST FLOWPATH FROM NODE 21500.00 TO NODE 21502.00 = 1485.20 FEET.
*******************
 FLOW PROCESS FROM NODE 21502.00 TO NODE 21512.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1123.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1109.00
 FLOW LENGTH (FEET) = 1064.46 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 18.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.26
 PIPE-FLOW(CFS) = 45.10
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 20.18
 LONGEST FLOWPATH FROM NODE 21500.00 TO NODE 21512.00 = 2549.66 FEET.
******************
 FLOW PROCESS FROM NODE 21512.00 TO NODE 21512.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 20.18
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.403
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                                    SCS
                                              αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                      В
                             14.82
                                      0.75
                                              0.100
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0215ZZ.RES

Page 3

```
"3-4 DWELLINGS/ACRE"
                      B 1.64 0.75 0.600
                                                    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 1.91 0.75 0.500
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.186
 SUBAREA AREA(ACRES) = 18.37
                            SUBAREA RUNOFF (CFS) = 37.43
 EFFECTIVE AREA(ACRES) = 39.01 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.16
 TOTAL AREA(ACRES) = 39.0
                              PEAK FLOW RATE (CFS) =
                                                    80.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*******************
 FLOW PROCESS FROM NODE 21512.00 TO NODE 21512.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 20.18
 RAINFALL INTENSITY (INCH/HR) = 2.40
 AREA-AVERAGED Fm(INCH/HR) = 0.12
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.16
 EFFECTIVE STREAM AREA(ACRES) = 39.01
 TOTAL STREAM AREA(ACRES) = 39.01
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
******************
 FLOW PROCESS FROM NODE 21510.00 TO NODE 21511.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 793.57
 ELEVATION DATA: UPSTREAM(FEET) = 1111.00 DOWNSTREAM(FEET) = 1110.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 16.696
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.693
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 COMMERCIAL
                    В
                           9.83
                                  0.75 0.100 56 16.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF (CFS) = 23.16
 TOTAL AREA (ACRES) = 9.83 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21511.00 TO NODE 21512.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

```
UPSTREAM NODE ELEVATION (FEET) = 1109.00
_____
 UPSTREAM NODE ELEVATION (FEET) = 1110.00
                                                                      DOWNSTREAM NODE ELEVATION (FEET) = 1104.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1109.00
                                                                      FLOW LENGTH (FEET) = 128.97 MANNING'S N = 0.013
 FLOW LENGTH (FEET) = 221.35 MANNING'S N = 0.013
                                                                      USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                      DEPTH OF FLOW IN 36.0 INCH PIPE IS 23.7 INCHES
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 18.4 INCHES
                                                                      PIPE-FLOW VELOCITY(FEET/SEC.) = 20.50
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.39
                                                                      PIPE-FLOW(CFS) = 101.34
 PIPE-FLOW(CFS) = 23.16
                                                                      *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.10 Tc (MIN.) = 20.29
                                                                      LONGEST FLOWPATH FROM NODE 21500.00 TO NODE 21513.00 = 2678.63 FEET.
 PIPEFLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 17.27
 LONGEST FLOWPATH FROM NODE 21510.00 TO NODE 21512.00 = 1014.92 FEET.
                                                                    *************************
******************
                                                                      FLOW PROCESS FROM NODE 21513.00 TO NODE 21513.00 IS CODE = 10
 FLOW PROCESS FROM NODE 21512.00 TO NODE 21512.00 IS CODE = 1
______
                                                                     >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                    _____
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
                                                                    _____
 TOTAL NUMBER OF STREAMS = 2
                                                                      FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 15.1
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.27
                                                                     >>>>DEFINE MEMORY BANK # 2 <<<<
 RAINFALL INTENSITY (INCH/HR) = 2.64
                                                                    AREA-AVERAGED Fm(INCH/HR) = 0.07
                                                                      PEAK FLOWRATE TABLE FILE NAME: 21470.DNA
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                      MEMORY BANK # 2 DEFINED AS FOLLOWS:
                                                                      PEAK FLOW RATE (CFS) = 7472.38 Tc (MIN.) = 58.81
 AREA-AVERAGED Ap = 0.10
 EFFECTIVE STREAM AREA(ACRES) = 9.83
                                                                      AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.48
 TOTAL STREAM AREA(ACRES) = 9.83
                                                                      TOTAL AREA (ACRES) = 14283.7
                                                                      LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21470.00 = 55971.39 FEET.
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                    ******************
 ** CONFLUENCE DATA **
  STREAM
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                      FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 14.0
                                                                    ______
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
        80.30 20.18 2.403 0.75(0.12) 0.16 39.0 21500.00
                                                                     >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
          23.16 17.27 2.639 0.75(0.07) 0.10 9.8 21510.00
                                                                    ______
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                      MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                      PEAK FLOW RATE (CFS) = 7472.38 Tc (MIN.) = 58.81
                                                                      AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.48
 ** PEAK FLOW RATE TABLE **
                                                                      TOTAL AREA (ACRES) = 14283.7
        Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                      LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21470.00 = 55971.39 FEET.
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                    *******************
         98.96 17.27 2.639 0.75(0.11) 0.14 43.2 21510.00
   1
         101.34 20.18 2.403 0.75(0.11) 0.14 48.8 21500.00
                                                                      FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 12
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                      >>>>CLEAR MEMORY BANK # 2 <<<<
 PEAK FLOW RATE (CFS) = 101.34 Tc (MIN.) = 20.18
                                                                    _____
 EFFECTIVE AREA(ACRES) = 48.84 AREA-AVERAGED Fm(INCH/HR) = 0.11
                                                                     AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.14
 TOTAL AREA (ACRES) = 48.8
                                                                      FLOW PROCESS FROM NODE 21470.00 TO NODE 21513.00 IS CODE = 54
 LONGEST FLOWPATH FROM NODE 21500.00 TO NODE 21512.00 = 2549.66 FEET.
                                                                      >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
*****************
                                                                     >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 FLOW PROCESS FROM NODE 21512.00 TO NODE 21513.00 IS CODE = 42
                                                                    ______
                                                                      ELEVATION DATA: UPSTREAM(FEET) = 1110.00 DOWNSTREAM(FEET) = 1104.00
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                      CHANNEL LENGTH THRU SUBAREA (FEET) = 186.42 CHANNEL SLOPE = 0.0322
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                      CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
                                                                      MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
```

Date: 04/21/2014 File name: LR0215ZZ.RES Page 5

Date: 04/21/2014 File name: LR0215ZZ.RES

Page 6

```
CHANNEL FLOW THRU SUBAREA(CFS) = 7472.38
                                                                            ** MEMORY BANK # 1 CONFLUENCE DATA **
 FLOW VELOCITY (FEET/SEC.) = 43.17 FLOW DEPTH (FEET) = 5.31
                                                                                      0
                                                                             STREAM
                                                                                           Tc Intensity Fp(Fm)
                                                                                                                  Ap Ae
                                                                                                                               HEADWATER
 TRAVEL TIME (MIN.) = 0.07 Tc (MIN.) = 58.88
                                                                             NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                        (ACRES) NODE
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21513.00 = 56157.82 FEET.
                                                                              1
                                                                                      98.96 17.39 2.628 0.75(0.11) 0.14 43.2 21510.00
                                                                                     101.34 20.29
                                                                                                  2.395 0.75(0.11)0.14
                                                                                                                        48.8 21500.00
LONGEST FLOWPATH FROM NODE 21500.00 TO NODE 21513.00 = 2678.63 FEET.
 FLOW PROCESS FROM NODE 21513.00 TO NODE 21513.00 IS CODE = 81
______
                                                                            COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            UNIT-HYDROGRAPH DATA:
                                                                            RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.19;3H= 1.94;6H= 2.64;24H= 5.81
______
 MAINLINE Tc(MIN.) = 58.88
                                                                            S-GRAPH: VALLEY (DEV.) = 77.6%; VALLEY (UNDEV.) / DESERT= 22.4%
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.264
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            Tc(HR) = 0.98; LAG(HR) = 0.79; Fm(INCH/HR) = 0.47; Ybar = 0.48
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                   Fρ
                                              Αp
                                                    SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
                     В
                          11.80
                                      0.75
                                             0.100
                                                                            3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 COMMERCIAL
 PUBLIC PARK
                     В
                             1.02
                                      0.75
                                              0.850
                                                    56
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14346.6
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21513.00 = 56157.82 FEET.
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       В
                              0.70
                                      0.75
                                              0.500
                                                     56
                                                                             EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 RESIDENTIAL
                                                                             Lca/L=0.3,n=.0233; Lca/L=0.4,n=.0209; Lca/L=0.5,n=.0192; Lca/L=0.6,n=.0179
 ".4 DWELLING/ACRE"
                       В
                              0.46
                                      0.75
                                              0.900
                                                     56
                                                                            TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3611.45
 MOBILE HOME PARK
                       В
                              0.08
                                      0.75
                                              0.250
                                                                            PEAK FLOW RATE (CFS) = 7503.95
 RESIDENTIAL
                                                                           ********************
                            0.03
 "11+ DWELLINGS/ACRE" B
                                      0.75
                                             0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            FLOW PROCESS FROM NODE 21513.00 TO NODE 21513.00 IS CODE = 12
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.201
 SUBAREA AREA(ACRES) = 14.09
                                                                            >>>>CLEAR MEMORY BANK # 1 <<<<<
 UNIT-HYDROGRAPH DATA:
                                                                           ______
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.19;3H= 1.94;6H= 2.64;24H= 5.81
                                                                           S-GRAPH: VALLEY(DEV.) = 77.5%; VALLEY(UNDEV.) / DESERT = 22.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            FLOW PROCESS FROM NODE 21513.00 TO NODE 21532.00 IS CODE = 54
 Tc(HR) = 0.98; LAG(HR) = 0.79; Fm(INCH/HR) = 0.47; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                           ______
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14297.7
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1104.00 DOWNSTREAM(FEET) = 1081.00
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21513.00 = 56157.82 FEET.
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 1794.30 CHANNEL SLOPE = 0.0128
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                            CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
  Lca/L=0.3,n=.0233; Lca/L=0.4,n=.0209; Lca/L=0.5,n=.0192; Lca/L=0.6,n=.0179
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3595.09
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 7503.95
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7475.90
                                                                            FLOW VELOCITY (FEET/SEC.) = 31.08 FLOW DEPTH (FEET) = 6.79
                                                                            TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 59.85
 TOTAL AREA (ACRES) = 14297.7 PEAK FLOW RATE (CFS) = 7475.90
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21532.00 = 57952.12 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           ******************
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                            FLOW PROCESS FROM NODE 21532.00 TO NODE 21532.00 IS CODE = 81
*****************
 FLOW PROCESS FROM NODE 21513.00 TO NODE 21513.00 IS CODE = 11
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           _____
                                                                            MAINLINE Tc(MIN.) = 59.85
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
                                                                            * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.252
_____
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 ** MAIN STREAM CONFLUENCE DATA **
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fρ
                                                                                                                        Аp
 PEAK FLOW RATE (CFS) = 7475.90 Tc (MIN.) = 58.88
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.48
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                       0.05
                                                                                                                 0.75
                                                                                                                         0.600
                                                                                                                                56
 TOTAL AREA (ACRES) = 14297.7
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21513.00 = 56157.82 FEET.
                                                                            PUBLIC PARK
                                                                                                В
                                                                                                        3.40
                                                                                                                 0.75
                                                                                                                         0.850
                                                                                                                                56
                                                                            COMMERCIAL
                                                                                                  В
                                                                                                         2.34
                                                                                                                 0.75
                                                                                                                         0.100
                                                                                                                                56
```

Page 7

Date: 04/21/2014

File name: LR021577.RFS

Date: 04/21/2014 File name: LR0215ZZ.RES

Page 8

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.545
 SUBAREA AREA(ACRES) = 5.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.19;3H= 1.94;6H= 2.64;24H= 5.81
 S-GRAPH: VALLEY (DEV.) = 77.6%; VALLEY (UNDEV.) / DESERT= 22.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.47; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14352.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21532.00 = 57952.12 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0230; Lca/L=0.4,n=.0206; Lca/L=0.5,n=.0190; Lca/L=0.6,n=.0177
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3612.64
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7442.09
 TOTAL AREA(ACRES) = 14352.4
                              PEAK FLOW RATE (CFS) = 7503.95
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
************************
 FLOW PROCESS FROM NODE 21532.00 TO NODE 21532.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 7503.95 Tc (MIN.) = 59.85
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.48
 TOTAL AREA(ACRES) = 14352.4
*************************
 FLOW PROCESS FROM NODE 21520.00 TO NODE 21521.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1080.64
 ELEVATION DATA: UPSTREAM(FEET) = 1265.00 DOWNSTREAM(FEET) = 1233.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.857
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.150
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                 Αp
                                                       SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.26
                                        0.75
                                                0.500
                                                      56 12.86
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 3.93
                                        0.98
                                                0.500 32 12.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA RUNOFF (CFS) = 22.56
 TOTAL AREA(ACRES) = 9.19 PEAK FLOW RATE(CFS) =
```

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 21521.00 TO NODE 21522.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1233.00 DOWNSTREAM ELEVATION(FEET) = 1230.00
 STREET LENGTH (FEET) = 334.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    36.27
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.94
 STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 14.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.908
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                         SCS
                                                  αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 10.25
                                         0.75
                                                  0.500
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       в 0.13
                                          0.75
                                                  0.600
                                                          56
                         В
 COMMERCIAL
                                0.15
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       A 1.54
                                         0.98 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.496
 SUBAREA AREA (ACRES) = 12.07 SUBAREA RUNOFF (CFS) = 27.40
 EFFECTIVE AREA(ACRES) = 21.26 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 21.3 PEAK FLOW RATE(CFS) =
                                                           47.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 28.19
 FLOW VELOCITY (FEET/SEC.) = 3.24 DEPTH*VELOCITY (FT*FT/SEC.) = 2.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 334.0 FT WITH ELEVATION-DROP = 3.0 FT, IS 41.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21522.00
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21522.00 = 1414.64 FEET.
```

File name: LR021577.RFS

Page 10

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

\* FLOW PROCESS FROM NODE 21522.00 TO NODE 21523.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 13 USED) <<<< UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1222.00 STREET LENGTH (FEET) = 682.54 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.76HALFSTREET FLOOD WIDTH (FEET) = 34.59 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.93 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.98STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 17.59 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.610 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE COMMERCIAL В 15.29 0.75 0.100 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" B 6.80 0.75 0.500 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.57 0.75 0.600 RESIDENTIAL "5-7 DWELLINGS/ACRE" A 0.20 0.98 0.500 32 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250 SUBAREA AREA(ACRES) = 23.86 SUBAREA RUNOFF(CFS) = 52.01 EFFECTIVE AREA(ACRES) = 45.12 AREA-AVERAGED Fm(INCH/HR) = 0.29 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.37 TOTAL AREA(ACRES) = 45.1 PEAK FLOW RATE(CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 39.22 FLOW VELOCITY (FEET/SEC.) = 4.15 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.37 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 682.5 FT WITH ELEVATION-DROP = 8.0 FT, IS 74.3 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21523.00

LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21523.00 = 2097.18 FEET.

FLOW PROCESS FROM NODE 21523.00 TO NODE 21524.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 13 USED) <<<<

\_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1222.00 DOWNSTREAM ELEVATION(FEET) = 1216.00 STREET LENGTH (FEET) = 1343.02 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\*

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

STREET FLOW DEPTH (FEET) = 1.02

HALFSTREET FLOOD WIDTH (FEET) = 49.59

AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.32

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.38

STREET FLOW TRAVEL TIME (MIN.) = 6.74 Tc (MIN.) = 24.33

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.149

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp αA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" в 6.71 0.75 0.600 56 COMMERCIAL B 37.61 0.75 0.100 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" B 2.57 0.75 0.500 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.193 SUBAREA AREA(ACRES) = 46.89 SUBAREA RUNOFF(CFS) = 84.56 EFFECTIVE AREA(ACRES) = 92.01 AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.28TOTAL AREA(ACRES) = 92.0 PEAK FLOW RATE (CFS) = 160.09

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.34

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 1.07 HALFSTREET FLOOD WIDTH(FEET) = 52.04 FLOW VELOCITY (FEET/SEC.) = 3.47 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.71

\*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 1343.0 FT WITH ELEVATION-DROP = 6.0 FT, IS 110.5 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21524.00 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21524.00 = 3440.20 FEET.

FLOW PROCESS FROM NODE 21524.00 TO NODE 21525.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 Date: 04/21/2014 File name: LR0215ZZ.RES Page 12 File name: LR021577.RFS Page 11

```
______
 UPSTREAM ELEVATION(FEET) = 1216.00 DOWNSTREAM ELEVATION(FEET) = 1192.00
 STREET LENGTH (FEET) = 1371.67 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 45.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.73
 STREET FLOW TRAVEL TIME (MIN.) = 3.76 Tc (MIN.) = 28.09
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.971
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       Fρ
                                                   Αp
                                                          SCS
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                        В
                             42.84 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.01 0.75
                                                   0.600
                                                          56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.50
                                                 0.500 56
                                           0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.210
 SUBAREA AREA(ACRES) = 56.35 SUBAREA RUNOFF(CFS) = 91.98
 EFFECTIVE AREA(ACRES) = 148.36 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 148.4
                                PEAK FLOW RATE (CFS) = 237.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.28; 6HR = 1.67; 24HR = 3.08
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 47.70
 FLOW VELOCITY (FEET/SEC.) = 6.33 DEPTH*VELOCITY (FT*FT/SEC.) = 6.21
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.13
 PIPE-FLOW(CFS) = 100.69
 PIPEFLOW TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 26.21
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.054
 SUBAREA AREA(ACRES) = 56.35 SUBAREA RUNOFF(CFS) = 96.22
```

```
TOTAL AREA (ACRES) = 148.4 PEAK FLOW RATE (CFS) =
                                                       248.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.28; 6HR = 1.67; 24HR = 3.08
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 147.83
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 41.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.73
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1371.7 FT WITH ELEVATION-DROP = 24.0 FT, IS 156.3 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21525.00
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21525.00 = 4811.87 FEET.
******************
 FLOW PROCESS FROM NODE 21525.00 TO NODE 21526.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1192.00 DOWNSTREAM ELEVATION(FEET) = 1173.00
 STREET LENGTH (FEET) = 1371.67 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.08
   HALFSTREET FLOOD WIDTH (FEET) = 52.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.68
 STREET FLOW TRAVEL TIME (MIN.) = 3.70 Tc (MIN.) = 29.91
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.898
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                  Aр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
                               47.24
                                         0.75
 COMMERCIAL
                                                 0.100
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.37
                                         0.75
                                                 0.600
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       В
                              0.16 0.75 0.500
                                                         56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.184
 SUBAREA AREA(ACRES) = 56.77 SUBAREA RUNOFF(CFS) = 89.95
 EFFECTIVE AREA(ACRES) = 205.13 AREA-AVERAGED Fm(INCH/HR) = 0.18
```

File name: LR0215ZZ.RES

Page 14

Date: 04/21/2014

```
AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.23
                                                                                       RESIDENTIAL
 TOTAL AREA (ACRES) = 205.1
                                PEAK FLOW RATE(CFS) = 317.57
                                                                                       "3-4 DWELLINGS/ACRE"
                                                                                                                В
                                                                                                                        4.74
                                                                                                                                  0.75
                                                                                                                                          0.600
                                                                                                                        0.33
                                                                                       SCHOOL
                                                                                                                                  0.75
                                                                                                                                          0.600
                                                                                                                                                  56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       RESIDENTIAL
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                                       "5-7 DWELLINGS/ACRE"
                                                                                                                B 0.53 0.75 0.500
                                                                                       SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                       SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.150
 DEPTH(FEET) = 1.11 HALFSTREET FLOOD WIDTH(FEET) = 53.99
                                                                                       SUBAREA AREA(ACRES) = 54.94
                                                                                                                       SUBAREA RUNOFF (CFS) = 89.08
 FLOW VELOCITY (FEET/SEC.) = 6.32 DEPTH*VELOCITY (FT*FT/SEC.) = 6.99
                                                                                       EFFECTIVE AREA(ACRES) = 260.07 AREA-AVERAGED Fm(INCH/HR) = 0.16
                                                                                       AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.22
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                       TOTAL AREA(ACRES) = 260.1
                                                                                                                        PEAK FLOW RATE(CFS) =
                                                                                                                                                  409.56
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                       SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                       5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
                                                                                       STREET CROSS-SECTION INFORMATION:
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.41
                                                                                       CURB HEIGHT (INCHES) = 8.0
                                                                                                                   STREET HALFWIDTH (FEET) = 32.00
 PIPE-FLOW(CFS) = 213.40
                                                                                       DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 27.92
                                                                                       INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.978
                                                                                       OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA (ACRES) = 56.77 SUBAREA RUNOFF (CFS) = 94.06
                                                                                       SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 TOTAL AREA (ACRES) = 205.1 PEAK FLOW RATE (CFS) = 332.40
                                                                                       MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                       STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                                       Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                       *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 118.99
                                                                                       STREETFLOW HYDRAULICS BASED ON MAINLINE To :
   ***STREET FLOWING FULL***
                                                                                       STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 164.51
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                         ***STREET FLOWING FULL***
   STREET FLOW DEPTH(FEET) = 0.84
                                                                                         STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   HALFSTREET FLOOD WIDTH (FEET) = 40.74
                                                                                         STREET FLOW DEPTH(FEET) = 0.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.73
                                                                                         HALFSTREET FLOOD WIDTH (FEET) = 44.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.98
                                                                                         AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.20
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                         PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.77
       AND L = 1371.7 FT WITH ELEVATION-DROP = 19.0 FT, IS 153.9 CFS,
        WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21526.00
                                                                                       *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21526.00 = 6183.54 FEET.
                                                                                       *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
                                                                                       ESTIMATED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
*******************
                                                                                       ASSUME FULL-FLOWING PIPELINE
 FLOW PROCESS FROM NODE 21526.00 TO NODE 21527.00 IS CODE = 33
                                                                                       PIPE-FLOW VELOCITY (FEET/SEC.) = 14.30
                                                                                       PIPE-FLOW(CFS) = 280.97
                                                                                       PIPEFLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 29.45
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                       * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.916
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
                                                                                       SUBAREA AREA(ACRES) = 54.94 SUBAREA RUNOFF(CFS) = 89.18
                                                                                       TOTAL AREA (ACRES) = 260.1
                                                                                                                         PEAK FLOW RATE(CFS) = 410.05
 UPSTREAM NODE ELEVATION (FEET) = 1173.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1155.00
                                                                                       STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 FLOW LENGTH (FEET) = 1315.02 MANNING'S N = 0.013
                                                                                       STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 129.08
                                                                                        ***STREET FLOWING FULL***
                                                                                         STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
                                                                                         STREET FLOW DEPTH (FEET) = 0.86
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.82
                                                                                         HALFSTREET FLOOD WIDTH (FEET) = 41.66
 PIPE-FLOW(CFS) = 245.05
                                                                                         AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.84
 PIPEFLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 29.50
                                                                                         PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.16
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.914
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                       *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                            SCS
                                                                                       PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
      LAND USE
                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 COMMERCIAL
                        В
                                  49.34
                                        0.75
                                                  0.100 56
                                                                                              AND L = 1315.0 FT WITH ELEVATION-DROP = 18.0 FT, IS 151.5 CFS,
```

Page 15

Date: 04/21/2014

File name: LR0215ZZ.RES

Date: 04/21/2014

File name: LR0215ZZ.RES

Page 16

```
WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21527.00
                                                                                   ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21527.00 = 7498.56 FEET.
                                                                                   ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
                                                                                   ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.52
 FLOW PROCESS FROM NODE 21527.00 TO NODE 21528.00 IS CODE = 63
                                                                                   PIPE-FLOW(CFS) =
                                                                                                     382.57
                                                                                   PIPEFLOW TRAVEL TIME (MIN.) = 1.54 Tc (MIN.) = 30.99
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.858
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                   SUBAREA AREA(ACRES) = 49.69
                                                                                                                 SUBAREA RUNOFF (CFS) = 72.96
                                                                                   TOTAL AREA (ACRES) = 309.8 PEAK FLOW RATE (CFS) = 469.48
_____
 UPSTREAM ELEVATION(FEET) = 1155.00 DOWNSTREAM ELEVATION(FEET) = 1143.00
 STREET LENGTH (FEET) = 1250.52 CURB HEIGHT (INCHES) = 8.0
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HALFWIDTH (FEET) = 32.00
                                                                                   5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                   STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.92
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    ***STREET FLOWING FULL***
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH(FEET) = 0.81
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 39.40
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.78
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.08
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                        AND L = 1250.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 127.6 CFS,
                                                                                         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21528.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21528.00 = 8749.08 FEET.
   ***STREET FLOWING FULL***
                                                                                 *******************
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   FLOW PROCESS FROM NODE 21528.00 TO NODE 21529.00 IS CODE = 33
   STREET FLOW DEPTH(FEET) = 1.31
   HALFSTREET FLOOD WIDTH (FEET) = 63.94
                                                                                 ______
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.04
                                                                                  >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.88
                                                                                  >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 STREET FLOW TRAVEL TIME (MIN.) = 3.45 Tc (MIN.) = 32.90
                                                                                 ______
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.793
                                                                                   UPSTREAM NODE ELEVATION (FEET) = 1143.00
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   DOWNSTREAM NODE ELEVATION (FEET) = 1125.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                  FLOW LENGTH (FEET) = 1283.55 MANNING'S N = 0.013
                                         Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                       В
                               32.96
                                      0.75
                                                0.100 56
                                                                                   USER SPECIFIED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
 RESIDENTIAL
                                                                                   USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 "3-4 DWELLINGS/ACRE"
                     В 5.13
                                         0.75
                                                 0.600
                                                        56
                                                                                   PIPE-FLOW VELOCITY(FEET/SEC.) = 14.95
 AGRICULTURAL FAIR COVER
                                                                                   PIPE-FLOW(CFS) = 323.92
 "ORCHARDS"
                        В
                                7.12
                                         0.63
                                                1.000
                                                       65
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 32.42
                                4.48
                                         0.75
                                                                                   * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.808
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                          SCS
 SUBAREA AREA(ACRES) = 49.69
                               SUBAREA RUNOFF (CFS) = 70.03
                                                                                      LAND USE
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 EFFECTIVE AREA(ACRES) = 309.76 AREA-AVERAGED Fm(INCH/HR) = 0.17
                                                                                   RESIDENTIAL
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.23
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                        В 1.95
                                                                                                                                           56
                                                                                                                           0.75
                                                                                                                                   0.600
 TOTAL AREA(ACRES) = 309.8 PEAK FLOW RATE(CFS) =
                                                      451.22
                                                                                   COMMERCIAL
                                                                                                                31.27
                                                                                                                           0.75
                                                                                                                                   0.100
                                                                                   RESIDENTIAL
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                                        в 0.94
                                                                                                                           0.75 0.500
                                                                                   "5-7 DWELLINGS/ACRE"
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.140
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                                                SUBAREA RUNOFF (CFS) = 52.39
                                                                                   SUBAREA AREA(ACRES) = 34.16
 DEPTH(FEET) = 1.31 HALFSTREET FLOOD WIDTH(FEET) = 64.18
                                                                                   EFFECTIVE AREA(ACRES) = 343.92 AREA-AVERAGED Fm(INCH/HR) = 0.17
 FLOW VELOCITY (FEET/SEC.) = 6.07 DEPTH*VELOCITY (FT*FT/SEC.) = 7.95
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.22
                                                                                   TOTAL AREA (ACRES) = 343.9 PEAK FLOW RATE (CFS) = 508.03
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                   5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
```

Date: 04/21/2014 File name: LR0215ZZ.RES Page 17 Date: 04/21/2014 File name: LR0215ZZ.RES Page 18

```
STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                              STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 184.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 45.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.43
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.12
  *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
 ESTIMATED PIPE DIAMETER(INCH) = 69.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.89
 PIPE-FLOW(CFS) = 412.85
 PIPEFLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 32.34
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.811
 SUBAREA AREA (ACRES) = 34.16 SUBAREA RUNOFF (CFS) = 52.47
 TOTAL AREA (ACRES) = 343.9
                                  PEAK FLOW RATE (CFS) = 508.91
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 96.05
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 38.50
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.43
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
 PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21529.00 = 10032.63 FEET.
******************
 FLOW PROCESS FROM NODE 21529.00 TO NODE 21530.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1125.00 DOWNSTREAM ELEVATION(FEET) = 1113.00
 STREET LENGTH (FEET) = 1241.54 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    520.02
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.37
 HALFSTREET FLOOD WIDTH (FEET) = 67.29
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.30
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.65
STREET FLOW TRAVEL TIME (MIN.) = 3.28 Tc (MIN.) = 35.62
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.709
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp Ap
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
                      B 14.30 0.75 0.100
COMMERCIAL
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.05 0.75 0.600 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.134
SUBAREA AREA (ACRES) = 15.35 SUBAREA RUNOFF (CFS) = 22.22
EFFECTIVE AREA(ACRES) = 359.27 AREA-AVERAGED Fm(INCH/HR) = 0.16
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.22
TOTAL AREA (ACRES) = 359.3 PEAK FLOW RATE (CFS) = 508.91
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.36 HALFSTREET FLOOD WIDTH(FEET) = 66.81
FLOW VELOCITY (FEET/SEC.) = 6.27 DEPTH*VELOCITY (FT*FT/SEC.) = 8.54
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 13.94
PIPE-FLOW(CFS) = 428.11
PIPEFLOW TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 33.82
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.763
SUBAREA AREA(ACRES) = 15.35 SUBAREA RUNOFF(CFS) = 22.97
TOTAL AREA (ACRES) = 359.3 PEAK FLOW RATE (CFS) = 516.98
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 88.88
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.82
 HALFSTREET FLOOD WIDTH (FEET) = 39.58
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.81
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.12
```

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0215ZZ.RES Page 19 Date: 04/21/2014 File name: LR0215ZZ.RES Page 20

```
******************
 FLOW PROCESS FROM NODE 21530.00 TO NODE 21531.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1113.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1083.00
 FLOW LENGTH (FEET) = 2334.29 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.76
 PIPE-FLOW(CFS) = 351.06
 PIPEFLOW TRAVEL TIME (MIN.) = 2.64 Tc (MIN.) = 36.46
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.685
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       ďΨ
                                                         SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                       B 14.61 0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.76 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.154
 SUBAREA AREA(ACRES) = 16.37 SUBAREA RUNOFF(CFS) = 23.14
 EFFECTIVE AREA(ACRES) = 375.64 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.22
 TOTAL AREA (ACRES) = 375.6 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 165.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.93
   HALFSTREET FLOOD WIDTH (FEET) = 45.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.11
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.73
 *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
 ESTIMATED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
```

LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21530.00 = 11274.17 FEET.

```
PIPE-FLOW VELOCITY (FEET/SEC.) = 15.64
 PIPE-FLOW(CFS) = 442.73
 PIPEFLOW TRAVEL TIME (MIN.) = 2.49 Tc (MIN.) = 36.31
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.690
 SUBAREA AREA (ACRES) = 16.37 SUBAREA RUNOFF (CFS) = 23.20
 TOTAL AREA (ACRES) = 375.6
                              PEAK FLOW RATE (CFS) = 516.98
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 74.25
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.75
  HALFSTREET FLOOD WIDTH (FEET) = 33.66
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.09
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.06
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
 PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21531.00 = 13608.46 FEET.
******************
 FLOW PROCESS FROM NODE 21531.00 TO NODE 21532.00 IS CODE = 31
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1083.00 DOWNSTREAM(FEET) = 1081.00
 FLOW LENGTH (FEET) = 120.16 MANNING'S N = 0.013
 DEPTH OF FLOW IN 75.0 INCH PIPE IS 56.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.77
 ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 516.98
 PIPE TRAVEL TIME (MIN.) = 0.10 Tc (MIN.) = 36.41
 LONGEST FLOWPATH FROM NODE 21520.00 TO NODE 21532.00 = 13728.62 FEET.
FLOW PROCESS FROM NODE 21532.00 TO NODE 21532.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 36.41
 RAINFALL INTENSITY (INCH/HR) = 1.69
 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.22
 EFFECTIVE STREAM AREA(ACRES) = 375.64
 TOTAL STREAM AREA(ACRES) = 375.64
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 516.98
 ** CONFLUENCE DATA **
 STREAM 0
                Tc
                       AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
  1
         7503.95 59.85 14352.37 20120.00
         516.98 36.41 375.64 21520.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

Page 22

ASSUME FULL-FLOWING PIPELINE

Date: 04/21/2014 File name: LR0215ZZ.RES Page 21 Date: 04/21/2014 File name: LR0215ZZ.RES

```
UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.93;6H= 2.62;24H= 5.75
 S-GRAPH: VALLEY (DEV.) = 78.1%; VALLEY (UNDEV.) / DESERT = 21.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.46; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.61; 1HR = 0.62;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14728.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21532.00 = 57952.12 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0230; Lca/L=0.4,n=.0206; Lca/L=0.5,n=.0190; Lca/L=0.6,n=.0177
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3704.11
 PEAK FLOW RATE (CFS) = 7581.33
*************************
 FLOW PROCESS FROM NODE 21532.00 TO NODE 21586.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1081.00 DOWNSTREAM(FEET) = 1079.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 366.28 CHANNEL SLOPE = 0.0055
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7581.33
 FLOW VELOCITY (FEET/SEC.) = 22.88 FLOW DEPTH (FEET) = 8.50
 TRAVEL TIME (MIN.) = 0.27 Tc (MIN.) = 60.11
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21586.00 = 58318.40 FEET.
******************
 FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 21540.00 TO NODE 21541.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 880.41
 ELEVATION DATA: UPSTREAM(FEET) = 1185.00 DOWNSTREAM(FEET) = 1170.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.339
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.590
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
                                     Fρ
                                              αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B
                            2.95
                                      0.75
                                             0.200
                                                   56 11.02
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                            3.62
                                      0.75
                                             0.600
                                                   56 14.01
                              2.95
                                                    56 10.34
 COMMERCIAL
                                      0.75
                                             0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.321
```

```
SUBAREA RUNOFF(CFS) = 28.70
 TOTAL AREA (ACRES) = 9.52 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 2.96
***********************
 FLOW PROCESS FROM NODE 21541.00 TO NODE 21542.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1170.00 DOWNSTREAM ELEVATION(FEET) = 1158.00
 STREET LENGTH (FEET) = 697.81 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 22.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.60
 STREET FLOW TRAVEL TIME (MIN.) = 2.60 Tc (MIN.) = 12.94
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.137
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 4.32
                                         0.75
                                                 0.200
                                                         56
 RESIDENTIAL
                     в 9.37
                                                         56
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                 0.600
                                                 0.100
 COMMERCIAL
                         R
                                0.72
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455
 SUBAREA AREA(ACRES) = 14.41 SUBAREA RUNOFF(CFS) = 36.27
 EFFECTIVE AREA(ACRES) = 23.93 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 23.9 PEAK FLOW RATE(CFS) =
                                                          61.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 2.96
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.42
 FLOW VELOCITY (FEET/SEC.) = 4.83 DEPTH*VELOCITY (FT*FT/SEC.) = 3.03
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 697.8 FT WITH ELEVATION-DROP = 12.0 FT, IS 44.9 CFS,
```

File name: LR021577.RFS

Page 24

Date: 04/21/2014

```
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21542.00
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21542.00 = 1578.22 FEET.
FLOW PROCESS FROM NODE 21542.00 TO NODE 21543.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1158.00 DOWNSTREAM ELEVATION(FEET) = 1151.00
 STREET LENGTH (FEET) = 723.86 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.18
 STREET FLOW TRAVEL TIME (MIN.) = 2.85 Tc (MIN.) = 15.80
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.784
  SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                         Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 4.85
                                         0.75 0.200 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В 13.49
                                          0.75
                                                  0.600 56
                         В
                               0.99
                                          0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.474
 SUBAREA AREA(ACRES) = 19.33 SUBAREA RUNOFF(CFS) = 42.27
 EFFECTIVE AREA(ACRES) = 43.26 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
 TOTAL AREA (ACRES) = 43.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.48
 FLOW VELOCITY (FEET/SEC.) = 4.39 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 723.9 FT WITH ELEVATION-DROP = 7.0 FT, IS 55.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21543.00
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21543.00 = 2302.08 FEET.
```

```
FLOW PROCESS FROM NODE 21543.00 TO NODE 21544.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1151.00 DOWNSTREAM ELEVATION (FEET) = 1145.00
 STREET LENGTH (FEET) = 674.52 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.30
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.85
   HALFSTREET FLOOD WIDTH (FEET) = 35.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.43
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
 STREET FLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 18.33
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.546
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 4.49
                                        0.75
                                                0.200
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        B 14.43
                                        0.75
                                                0.600
                                                        56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              0.09
                                        0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.507
 SUBAREA AREA (ACRES) = 19.01 SUBAREA RUNOFF (CFS) = 37.08
 EFFECTIVE AREA (ACRES) = 62.27 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 62.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.87 HALFSTREET FLOOD WIDTH(FEET) = 36.51
 FLOW VELOCITY (FEET/SEC.) = 4.51 DEPTH*VELOCITY (FT*FT/SEC.) = 3.93
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 674.5 FT WITH ELEVATION-DROP = 6.0 FT, IS 51.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21544.00
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21544.00 = 2976.60 FEET.
FLOW PROCESS FROM NODE 21544.00 TO NODE 21545.00 IS CODE = 63
```

File name: LR0215ZZ.RES

Page 26

Date: 04/21/2014

```
UPSTREAM ELEVATION(FEET) = 1137.00 DOWNSTREAM ELEVATION(FEET) = 1129.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                     STREET LENGTH (FEET) = 662.74 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                     STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1145.00 DOWNSTREAM ELEVATION(FEET) = 1137.00
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 655.20 CURB HEIGHT (INCHES) = 6.0
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                       ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       STREET FLOW DEPTH(FEET) = 0.92
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 141.38
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 38.89
   ***STREET FLOWING FULL***
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.00
   STREET FLOW DEPTH (FEET) = 0.86
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 22.44
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.255
   HALFSTREET FLOOD WIDTH (FEET) = 36.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.25
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.53
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                              SCS
                                                                                         LAND USE
 STREET FLOW TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 20.41
                                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     COMMERCIAL
                                                                                                          B 0.78 0.75 0.100
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.387
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                     RESIDENTIAL
                                                                                     "11+ DWELLINGS/ACRE" B 4.15 0.75 0.200
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                               56
                                       Fр
                                                          SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                     RESIDENTIAL.
 RESIDENTIAL
                                                                                     "3-4 DWELLINGS/ACRE"
                                                                                                           B 17.07 0.75 0.600
                                                                                                                                               56
 "11+ DWELLINGS/ACRE" B 4.55
                                          0.75 0.200 56
                                                                                     SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                     SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.507
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 15.17 0.75 0.600 56
                                                                                     SUBAREA AREA (ACRES) = 22.00 SUBAREA RUNOFF (CFS) = 37.15
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                     EFFECTIVE AREA(ACRES) = 103.99 AREA-AVERAGED Fm(INCH/HR) = 0.36
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.508
                                                                                     AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
 SUBAREA AREA (ACRES) = 19.72 SUBAREA RUNOFF (CFS) = 35.62
                                                                                     TOTAL AREA (ACRES) = 104.0 PEAK FLOW RATE (CFS) = 177.69
 EFFECTIVE AREA(ACRES) = 81.99 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 82.0 PEAK FLOW RATE (CFS) = 150.27
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                     DEPTH(FEET) = 0.93 HALFSTREET FLOOD WIDTH(FEET) = 39.68
                                                                                     FLOW VELOCITY (FEET/SEC.) = 5.51 DEPTH*VELOCITY (FT*FT/SEC.) = 5.15
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 37.06
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 FLOW VELOCITY (FEET/SEC.) = 5.33 DEPTH*VELOCITY (FT*FT/SEC.) = 4.70
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
       AND L = 655.2 FT WITH ELEVATION-DROP = 8.0 FT, IS 56.5 CFS,
                                                                                     ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21545.00
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21545.00 = 3631.80 FEET.
                                                                                     ASSUME FULL-FLOWING PIPELINE
                                                                                     PIPE-FLOW VELOCITY(FEET/SEC.) = 7.29
*****************
                                                                                     PIPE-FLOW(CFS) =
                                                                                                        22.91
 FLOW PROCESS FROM NODE 21545.00 TO NODE 21546.00 IS CODE = 63
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 21.93
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.287
                                                                                     SUBAREA AREA (ACRES) = 22.00 SUBAREA RUNOFF (CFS) = 37.77
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                     TOTAL AREA (ACRES) = 104.0 PEAK FLOW RATE (CFS) = 180.63
```

Date: 04/21/2014 File name: LR0215ZZ.RES Page 27 Date: 04/21/2014 File name: LR0215ZZ.RES Page 28

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 157.72
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 37.85
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.81
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21546.00 = 4294.54 FEET.
FLOW PROCESS FROM NODE 21546.00 TO NODE 21547.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1129.00 DOWNSTREAM ELEVATION(FEET) = 1122.00
 STREET LENGTH (FEET) = 569.28 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.97
   HALFSTREET FLOOD WIDTH (FEET) = 41.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.68
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.48
 STREET FLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 23.60
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.188
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                qΑ
                                                      SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      В
                              8.36
                                      0.75
                                                 0.100 56
 COMMERCIAL
                      В
                              0.03
                                         0.75 0.850 56
 PUBLIC PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.59
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.391
 SUBAREA AREA(ACRES) = 19.98
                             SUBAREA RUNOFF(CFS) = 34.08
 EFFECTIVE AREA(ACRES) = 123.97 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 124.0 PEAK FLOW RATE (CFS) =
                                                         205.49
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

```
DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 41.88
 FLOW VELOCITY (FEET/SEC.) = 5.74 DEPTH*VELOCITY (FT*FT/SEC.) = 5.61
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.09
 PIPE-FLOW(CFS) =
                     54.07
 PIPEFLOW TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 22.97
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.224
 SUBAREA AREA (ACRES) = 19.98 SUBAREA RUNOFF (CFS) = 34.72
 TOTAL AREA (ACRES) = 124.0 PEAK FLOW RATE (CFS) = 209.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 155.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 37.48
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.39
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.80
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21547.00 = 4863.82 FEET.
*******************
 FLOW PROCESS FROM NODE 21547.00 TO NODE 21548.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1122.00 DOWNSTREAM ELEVATION(FEET) = 1115.00
 STREET LENGTH (FEET) = 537.06 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.99
   HALFSTREET FLOOD WIDTH (FEET) = 42.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.92
 STREET FLOW TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 24.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141
```

File name: LR0215ZZ.RES

Page 30

END OF SUBAREA STREET FLOW HYDRAULICS:

Date: 04/21/2014

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                          Fρ
                                                    Αp
     LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                                 8.51
                                          0.75
                                                   0.400
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                 4.88
 PUBLIC PARK
                       В
                                          0.75
                                                   0.850 56
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                        B 0.69
                                          0.75
 COMMERCIAL
                                                   0.100 56
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 RESIDENTIAL
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 "3-4 DWELLINGS/ACRE" B 1.83
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                          0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
                                                                                       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                         243.11
 SUBAREA AREA (ACRES) = 15.91 SUBAREA RUNOFF (CFS) = 24.78
                                                                                       ***STREET FLOWING FULL***
 EFFECTIVE AREA(ACRES) = 139.88 AREA-AVERAGED Fm(INCH/HR) = 0.35
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
                                                                                       STREET FLOW DEPTH(FEET) = 1.01
 TOTAL AREA (ACRES) = 139.9 PEAK FLOW RATE (CFS) = 224.99
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 43.34
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.39
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 25.32
                                                                                     * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.097
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 1.00 HALFSTREET FLOOD WIDTH(FEET) = 42.91
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                              Fρ
                                                                                                                                              SCS
                                                                                                                                       Αp
 FLOW VELOCITY (FEET/SEC.) = 5.99 DEPTH*VELOCITY (FT*FT/SEC.) = 5.98
                                                                                         LAND USE
                                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     RESIDENTIAL
                                                                                     "3-4 DWELLINGS/ACRE" B 0.06 0.75 0.600
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                                                                               56
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     RESIDENTIAL
                                                                                     "8-10 DWELLINGS/ACRE" B 17.33 0.75 0.400 56
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                     SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 ESTIMATED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                     SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.401
                                                                                     SUBAREA AREA (ACRES) = 17.39 SUBAREA RUNOFF (CFS) = 28.14
 ASSUME FULL-FLOWING PIPELINE
                                                                                     EFFECTIVE AREA(ACRES) = 157.27 AREA-AVERAGED Fm(INCH/HR) = 0.35
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.92
                                                                                     AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 PIPE-FLOW(CFS) = 70.20
 PIPEFLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 23.88
                                                                                     TOTAL AREA (ACRES) = 157.3 PEAK FLOW RATE (CFS) =
                                                                                                                                               247.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.173
 SUBAREA AREA(ACRES) = 15.91 SUBAREA RUNOFF(CFS) = 25.24
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA(ACRES) = 139.9
                                 PEAK FLOW RATE (CFS) = 229.04
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                     DEPTH(FEET) = 1.01 HALFSTREET FLOOD WIDTH(FEET) = 43.65
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                     FLOW VELOCITY (FEET/SEC.) = 6.38 DEPTH*VELOCITY (FT*FT/SEC.) = 6.46
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 158.84
   ***STREET FLOWING FULL***
                                                                                     *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                           THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   STREET FLOW DEPTH(FEET) = 0.89
                                                                                     SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
   HALFSTREET FLOOD WIDTH (FEET) = 37.42
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.91
                                                                                     ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21548.00 = 5400.88 FEET.
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 11.05
                                                                                     PIPE-FLOW(CFS) =
                                                                                                         91.73
PIPEFLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 24.71
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.129
 FLOW PROCESS FROM NODE 21548.00 TO NODE 21549.00 IS CODE = 63
                                                                                     SUBAREA AREA (ACRES) = 17.39 SUBAREA RUNOFF (CFS) = 28.63
                                                                                     TOTAL AREA (ACRES) = 157.3 PEAK FLOW RATE (CFS) = 252.11
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 UPSTREAM ELEVATION(FEET) = 1115.00 DOWNSTREAM ELEVATION(FEET) = 1107.00
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET LENGTH (FEET) = 551.01 CURB HEIGHT (INCHES) = 6.0
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HALFWIDTH (FEET) = 18.00
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 160.38
                                                                                       ***STREET FLOWING FULL***
```

Date: 04/21/2014 File name: LR0215ZZ.RES Page 31 Date: 04/21/2014 File name: LR0215ZZ.RES Page 32

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.75
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.06
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21549.00 = 5951.89 FEET.
******************
 FLOW PROCESS FROM NODE 21549.00 TO NODE 21550.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1107.00
 DOWNSTREAM NODE ELEVATION(FEET) = 1101.00
 FLOW LENGTH (FEET) = 766.86 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.81
 PIPE-FLOW(CFS) =
                    212.43
 PIPEFLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 25.89
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.070
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               0.29
                                          0.75
                                                  0.600
                                                         56
 RESIDENTIAL
                      В 13.34
 "8-10 DWELLINGS/ACRE"
                                          0.75
                                                  0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.404
                              SUBAREA RUNOFF(CFS) = 21.68
 SUBAREA AREA(ACRES) = 13.63
 EFFECTIVE AREA(ACRES) = 170.90 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 170.9 PEAK FLOW RATE (CFS) = 265.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 53.03
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.86
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.37
```

```
******************
 FLOW PROCESS FROM NODE 21550.00 TO NODE 21551.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_______
 UPSTREAM NODE ELEVATION (FEET) = 1101.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1100.00
 FLOW LENGTH (FEET) = 1070.86 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 102.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 102.0 INCH PIPE IS 69.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 6.43
 PIPE-FLOW(CFS) = 265.46
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.97 Tc (MIN.) = 28.86
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.939
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                          Fρ
                                                    Αp
                                                          SCS
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                46.15
                                          0.75
                                                   0.600
                                                           56
                       В
                               0.53
 COMMERCIAL
                        В
                                          0.75
                                                   0.100
                                                           56
                         R
                               1.63
                                          0.75
                                                   0.850
                                                           56
 PUBLIC PARK
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.04
                                          0.75
                                                  0.400
                                                           56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 48.35 SUBAREA RUNOFF (CFS) = 64.76
 EFFECTIVE AREA(ACRES) = 219.25 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 219.3 PEAK FLOW RATE (CFS) =
                                                           310.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                              STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 44.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.93
   HALFSTREET FLOOD WIDTH (FEET) = 45.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.27
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       Date: 04/21/2014
                        File name: LR0215ZZ.RES
                                                         Page 34
```

LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21550.00 = 6718.75 FEET.

```
AND L = 1070.9 FT WITH ELEVATION-DROP = 1.0 FT, IS 85.6 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21551.00
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21551.00 = 7789.61 FEET.
*************************
 FLOW PROCESS FROM NODE 21551.00 TO NODE 21584.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1100.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1099.00
 FLOW LENGTH (FEET) = 343.47 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.06
 PIPE-FLOW(CFS) = 288.51
 PIPEFLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 29.57
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.911
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Ар
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                       В
                               1.51
                                       0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 1.51 SUBAREA RUNOFF(CFS) = 2.50
 EFFECTIVE AREA(ACRES) = 220.76 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 220.8 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 21.62
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.46
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21584.00 = 8133.08 FEET.
FLOW PROCESS FROM NODE 21584.00 TO NODE 21584.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
```

```
TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 29.57
 RAINFALL INTENSITY (INCH/HR) = 1.91
 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.49
 EFFECTIVE STREAM AREA(ACRES) = 220.76
 TOTAL STREAM AREA(ACRES) = 220.76
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 310.12
******************
 FLOW PROCESS FROM NODE 21560.00 TO NODE 21561.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 620.68
 ELEVATION DATA: UPSTREAM(FEET) = 1123.00 DOWNSTREAM(FEET) = 1115.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.694
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.334
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                            5.33 0.75 0.400 56 11.69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA RUNOFF (CFS) = 14.56
 TOTAL AREA (ACRES) = 5.33 PEAK FLOW RATE (CFS) = 14.56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
FLOW PROCESS FROM NODE 21561.00 TO NODE 21584.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1115.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1099.00
 FLOW LENGTH (FEET) = 2676.72 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.23
 PIPE-FLOW(CFS) =
                 14.56
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 7.68 Tc (MIN.) = 19.37
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.463
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
```

File name: LR021577.RFS

Page 36

Date: 04/21/2014

\_\_\_\_\_

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 5.33 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
 TOTAL AREA (ACRES) = 5.3 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 21560.00 TO NODE 21584.00 = 3297.40 FEET.
*******************
 FLOW PROCESS FROM NODE 21584.00 TO NODE 21584.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.37
 RAINFALL INTENSITY (INCH/HR) = 2.46
 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.40
 EFFECTIVE STREAM AREA(ACRES) = 5.33
 TOTAL STREAM AREA(ACRES) = 5.33
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 14.56
******************
 FLOW PROCESS FROM NODE 21570.00 TO NODE 21571.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 940.47
 ELEVATION DATA: UPSTREAM(FEET) = 1173.00 DOWNSTREAM(FEET) = 1164.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.697
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.174
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               αA
                                                     SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                               6.71
                                       0.75 0.200 56 12.70
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA RUNOFF (CFS) = 18.26
 TOTAL AREA(ACRES) = 6.71 PEAK FLOW RATE(CFS) = 18.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21571.00 TO NODE 21572.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1164.00 DOWNSTREAM ELEVATION(FEET) = 1162.00
 STREET LENGTH (FEET) = 345.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 17.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.81
 STREET FLOW TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 14.63
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.915
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                   αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 8.71 0.75 0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA (ACRES) = 8.71 SUBAREA RUNOFF (CFS) = 21.68
 EFFECTIVE AREA(ACRES) = 15.42 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA(ACRES) = 15.4 PEAK FLOW RATE(CFS) =
                                                           38.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.67 HALFSTREET FLOOD WIDTH (FEET) = 20.93
 FLOW VELOCITY (FEET/SEC.) = 3.17 DEPTH*VELOCITY (FT*FT/SEC.) = 2.12
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 345.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 28.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21572.00
```

File name: LR0215ZZ.RES

Page 38

Date: 04/21/2014

FLOW PROCESS FROM NODE 21573.00 TO NODE 21574.00 IS CODE = 63

File name: LR0215ZZ.RES

Page 39

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014

```
>>>> (STREET TABLE SECTION # 16 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1157.00 DOWNSTREAM ELEVATION(FEET) = 1153.00
 STREET LENGTH (FEET) = 469.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 25.63
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.17
 STREET FLOW TRAVEL TIME (MIN.) = 1.88 Tc (MIN.) = 18.09
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.567
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 10.28 0.75 0.200 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA (ACRES) = 10.28 SUBAREA RUNOFF (CFS) = 22.36
 EFFECTIVE AREA(ACRES) = 34.88 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA (ACRES) = 34.9 PEAK FLOW RATE (CFS) = 75.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 26.97
 FLOW VELOCITY (FEET/SEC.) = 4.24 DEPTH*VELOCITY (FT*FT/SEC.) = 3.35
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 469.2 FT WITH ELEVATION-DROP = 4.0 FT, IS 32.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21574.00
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21574.00 = 2176.86 FEET.
FLOW PROCESS FROM NODE 21574.00 TO NODE 21575.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

>>>> (STREET TABLE SECTION # 16 USED) <<<<

\_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1153.00 DOWNSTREAM ELEVATION(FEET) = 1150.00 STREET LENGTH (FEET) = 517.71 CURB HEIGHT (INCHES) = 6.0

STREET HALFWIDTH (FEET) = 12.50

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   87.36
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.89
 HALFSTREET FLOOD WIDTH (FEET) = 31.79
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.71
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.29
STREET FLOW TRAVEL TIME (MIN.) = 2.33 Tc (MIN.) = 20.41
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.387
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
                                       Fp
                                                  Дp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"11+ DWELLINGS/ACRE" B 11.41 0.75 0.200 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
SUBAREA AREA(ACRES) = 11.41 SUBAREA RUNOFF(CFS) = 22.97
EFFECTIVE AREA(ACRES) = 46.29 AREA-AVERAGED Fm(INCH/HR) = 0.15
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
TOTAL AREA(ACRES) = 46.3 PEAK FLOW RATE(CFS) =
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.91 HALFSTREET FLOOD WIDTH(FEET) = 32.77
FLOW VELOCITY (FEET/SEC.) = 3.76 DEPTH*VELOCITY (FT*FT/SEC.) = 3.40
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 5.05
PIPE-FLOW(CFS) =
                   15.87
PIPEFLOW TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 19.80
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.431
SUBAREA AREA (ACRES) = 11.41 SUBAREA RUNOFF (CFS) = 23.43
TOTAL AREA (ACRES) = 46.3 PEAK FLOW RATE (CFS) = 95.05
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 79.18
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.86
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.12
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21575.00 = 2694.57 FEET.
******************
 FLOW PROCESS FROM NODE 21575.00 TO NODE 21576.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1150.00 DOWNSTREAM ELEVATION(FEET) = 1144.00
 STREET LENGTH (FEET) = 517.78 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.84
   HALFSTREET FLOOD WIDTH (FEET) = 29.53
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.29
 STREET FLOW TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 21.49
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.315
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 11.25 0.75 0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA(ACRES) = 11.25 SUBAREA RUNOFF(CFS) = 21.92
 EFFECTIVE AREA(ACRES) = 57.54 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA (ACRES) = 57.5 PEAK FLOW RATE (CFS) = 112.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 30.33
 FLOW VELOCITY (FEET/SEC.) = 5.16 DEPTH*VELOCITY (FT*FT/SEC.) = 4.42
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 7.14
 PIPE-FLOW(CFS) =
                    22.45
 PIPEFLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 21.01
```

HALFSTREET FLOOD WIDTH (FEET) = 30.33

Date: 04/21/2014 File name: LR0215ZZ.RES Page 41 Date: 04/21/2014

File name: LR0215ZZ.RES Page 42

```
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.346
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 SUBAREA AREA (ACRES) = 11.25 SUBAREA RUNOFF (CFS) = 22.24
 TOTAL AREA (ACRES) = 57.5 PEAK FLOW RATE (CFS) = 113.76
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 30.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     FLOW VELOCITY (FEET/SEC.) = 6.02 DEPTH*VELOCITY (FT*FT/SEC.) = 5.15
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 91.31
                                                                                     ASSUME FULL-FLOWING PIPELINE
   ***STREET FLOWING FULL***
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 8.33
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     PIPE-FLOW(CFS) =
                                                                                                        26.20
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 22.02
   STREET FLOW DEPTH(FEET) = 0.80
                                                                                     * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.281
   HALFSTREET FLOOD WIDTH (FEET) = 27.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
                                                                                     SUBAREA AREA (ACRES) = 11.21 SUBAREA RUNOFF (CFS) = 21.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.97
                                                                                     TOTAL AREA (ACRES) = 68.8 PEAK FLOW RATE (CFS) = 131.87
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21576.00 = 3212.35 FEET.
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
******************
                                                                                     5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 FLOW PROCESS FROM NODE 21576.00 TO NODE 21577.00 IS CODE = 63
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 105.67
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                      ***STREET FLOWING FULL***
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                                      STREET FLOW DEPTH (FEET) = 0.80
 UPSTREAM ELEVATION(FEET) = 1144.00 DOWNSTREAM ELEVATION(FEET) = 1136.00
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 27.28
 STREET LENGTH (FEET) = 506.86 CURB HEIGHT (INCHES) = 6.0
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.80
 STREET HALFWIDTH (FEET) = 12.50
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.62
                                                                                     LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21577.00 = 3719.21 FEET.
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
                                                                                   ******************
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     FLOW PROCESS FROM NODE 21577.00 TO NODE 21578.00 IS CODE = 63
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     >>>> (STREET TABLE SECTION # 16 USED) <<<<
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   ______
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     UPSTREAM ELEVATION (FEET) = 1136.00 DOWNSTREAM ELEVATION (FEET) = 1130.00
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                     STREET LENGTH (FEET) = 412.82 CURB HEIGHT (INCHES) = 6.0
                                                                                     STREET HALFWIDTH (FEET) = 12.50
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 124.38
   ***STREET FLOWING FULL***
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREET FLOW DEPTH(FEET) = 0.84
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   HALFSTREET FLOOD WIDTH (FEET) = 29.60
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.02
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 22.42
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.256
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                 Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 140.46
                                                                                       ***STREET FLOWING FULL***
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                       B 11.21 0.75 0.200 56
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                      STREET FLOW DEPTH (FEET) = 0.89
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 32.04
 SUBAREA AREA(ACRES) = 11.21 SUBAREA RUNOFF(CFS) = 21.25
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.89
 EFFECTIVE AREA(ACRES) = 68.75 AREA-AVERAGED Fm(INCH/HR) = 0.15
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 23.19
 TOTAL AREA (ACRES) = 68.8 PEAK FLOW RATE (CFS) = 130.35
                                                                                     * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.211
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
```

Page 43

Date: 04/21/2014

File name: LR0215ZZ.RES

Date: 04/21/2014 File name: LR0215ZZ.RES Page 44

SCS

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B
                               8.62
                                          0.75
                                                  0.200 56
 COMMERCIAL
                       В
                               0.61 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.193
 SUBAREA AREA(ACRES) = 9.23 SUBAREA RUNOFF(CFS) = 17.17
 EFFECTIVE AREA(ACRES) = 77.98 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA (ACRES) = 78.0 PEAK FLOW RATE (CFS) = 144.73
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 32.46
 FLOW VELOCITY (FEET/SEC.) = 5.93 DEPTH*VELOCITY (FT*FT/SEC.) = 5.33
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.65
 PIPE-FLOW(CFS) = 34.42
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 22.82
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.233
 SUBAREA AREA (ACRES) = 9.23 SUBAREA RUNOFF (CFS) = 17.35
 TOTAL AREA (ACRES) = 78.0 PEAK FLOW RATE (CFS) = 146.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 111.83
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.82
   HALFSTREET FLOOD WIDTH (FEET) = 28.68
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.66
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21578.00 = 4132.03 FEET.
********************
 FLOW PROCESS FROM NODE 21578.00 TO NODE 21579.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1130.00 DOWNSTREAM ELEVATION(FEET) = 1123.00
 STREET LENGTH (FEET) = 399.88 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 32.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.77
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 23.85
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.174
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B
                               4.85
                                        0.75 0.200
                                                        56
                      В
                               4.00 0.75 0.100
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.155
 SUBAREA AREA(ACRES) = 8.85 SUBAREA RUNOFF(CFS) = 16.40
 EFFECTIVE AREA(ACRES) = 86.83 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
 TOTAL AREA (ACRES) = 86.8 PEAK FLOW RATE (CFS) = 158.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 32.46
 FLOW VELOCITY (FEET/SEC.) = 6.50 DEPTH*VELOCITY (FT*FT/SEC.) = 5.84
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.49
 PIPE-FLOW(CFS) =
                   37.77
 PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 23.52
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.193
 SUBAREA AREA (ACRES) = 8.85 SUBAREA RUNOFF (CFS) = 16.54
 TOTAL AREA (ACRES) = 86.8 PEAK FLOW RATE (CFS) = 159.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 122.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.82
   HALFSTREET FLOOD WIDTH (FEET) = 28.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.10
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21579.00 = 4531.91 FEET.
FLOW PROCESS FROM NODE 21579.00 TO NODE 21580.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1123.00 DOWNSTREAM ELEVATION(FEET) = 1118.00
```

File name: LR021577.RFS

Page 46

Date: 04/21/2014

```
STREET LENGTH (FEET) = 423.30 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 12.50
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 169.00
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.98
 HALFSTREET FLOOD WIDTH (FEET) = 36.68
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.59
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.50
STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 24.78
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.125
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                   Αp
                                                          SCS
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                    В
                                                  0.200 56
"11+ DWELLINGS/ACRE"
                                4.37
                                          0.75
COMMERCIAL
                      В
                                5.00
                                         0.75 0.100 56
                      В
                               0.80
                                          0.75 0.850 56
PUBLIC PARK
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.202
SUBAREA AREA (ACRES) = 10.17 SUBAREA RUNOFF (CFS) = 18.07
EFFECTIVE AREA(ACRES) = 97.00 AREA-AVERAGED Fm(INCH/HR) = 0.15
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
TOTAL AREA (ACRES) = 97.0 PEAK FLOW RATE (CFS) = 172.74
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 37.04
FLOW VELOCITY (FEET/SEC.) = 5.61 DEPTH*VELOCITY (FT*FT/SEC.) = 5.56
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.96
PIPE-FLOW(CFS) = 121.18
PIPEFLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 24.16
* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.157
SUBAREA AREA (ACRES) = 10.17 SUBAREA RUNOFF (CFS) = 18.36
TOTAL AREA(ACRES) = 97.0 PEAK FLOW RATE(CFS) = 175.57
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

```
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 54.39
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 20.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.02
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21580.00 = 4955.21 FEET.
******************
 FLOW PROCESS FROM NODE 21580.00 TO NODE 21581.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1118.00 DOWNSTREAM ELEVATION (FEET) = 1114.00
 STREET LENGTH (FEET) = 424.89 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.22
   HALFSTREET FLOOD WIDTH (FEET) = 48.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.79
 STREET FLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 25.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.092
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                   αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESTDENTIAL.
 "11+ DWELLINGS/ACRE" B 100.00 0.75 0.200
                                                          56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 18.20 0.75 0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.200
 SUBAREA AREA (ACRES) = 118.20 SUBAREA RUNOFF (CFS) = 206.65
 EFFECTIVE AREA(ACRES) = 215.20 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA (ACRES) = 215.2 PEAK FLOW RATE (CFS) = 376.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.35 HALFSTREET FLOOD WIDTH(FEET) = 54.92
```

File name: LR0215ZZ.RES

Page 48

STREETFLOW HYDRAULICS BASED ON MAINLINE To :

Date: 04/21/2014

```
FLOW VELOCITY (FEET/SEC.) = 5.91 DEPTH*VELOCITY (FT*FT/SEC.) = 7.98
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 44.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.61
 PIPE-FLOW(CFS) = 175.57
 PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 24.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.128
 SUBAREA AREA(ACRES) = 118.20 SUBAREA RUNOFF(CFS) = 210.44
 TOTAL AREA (ACRES) = 215.2 PEAK FLOW RATE (CFS) = 383.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 207.86
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.10
   HALFSTREET FLOOD WIDTH (FEET) = 42.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.81
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 424.9 FT WITH ELEVATION-DROP = 4.0 FT, IS 391.8 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21581.00
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21581.00 = 5380.10 FEET.
*******************
 FLOW PROCESS FROM NODE 21581.00 TO NODE 21582.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 16 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1114.00 DOWNSTREAM ELEVATION(FEET) = 1109.00
 STREET LENGTH (FEET) = 781.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 12.50
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 5.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 432.43
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.51
   HALFSTREET FLOOD WIDTH (FEET) = 63.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.21
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.88
```

```
STREET FLOW TRAVEL TIME (MIN.) = 2.50 Tc (MIN.) = 27.22
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.008
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                          SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                       B 0.48 0.75
                                                  0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.11 0.75
SCHOOL B 3.06 0.75
                                                   0.600
                                                   0.600
                                                           56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 55.41 0.75 0.200
                                                           56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.221
 SUBAREA AREA (ACRES) = 59.06 SUBAREA RUNOFF (CFS) = 97.98
 EFFECTIVE AREA(ACRES) = 274.26 AREA-AVERAGED Fm(INCH/HR) = 0.15
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.20
 TOTAL AREA (ACRES) = 274.3 PEAK FLOW RATE (CFS) = 458.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.54 HALFSTREET FLOOD WIDTH(FEET) = 64.63
 FLOW VELOCITY (FEET/SEC.) = 5.28 DEPTH*VELOCITY (FT*FT/SEC.) = 8.14
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 78.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 78.0 INCH PIPE IS 63.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.28
 PIPE-FLOW(CFS) = 383.43
 PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 25.70
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.079
 SUBAREA AREA (ACRES) = 59.06 SUBAREA RUNOFF (CFS) = 101.72
 TOTAL AREA(ACRES) = 274.3
                                 PEAK FLOW RATE (CFS) = 475.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 92.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 31.85
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.46
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
  AND L = 781.6 FT WITH ELEVATION-DROP = 5.0 FT, IS 165.8 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21582.00
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21582.00 = 6161.70 FEET.
******************
 FLOW PROCESS FROM NODE 21582.00 TO NODE 21583.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

Date: 04/21/2014

>>>> (STREET TABLE SECTION # 14 USED) <<<<

File name: LR021577.RFS

Page 49

```
_____
 UPSTREAM ELEVATION(FEET) = 1109.00 DOWNSTREAM ELEVATION(FEET) = 1105.00
 STREET LENGTH (FEET) = 614.55 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 492.41
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.41
   HALFSTREET FLOOD WIDTH (FEET) = 76.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.15
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 7.28
 STREET FLOW TRAVEL TIME (MIN.) = 1.99 Tc (MIN.) = 27.69
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.988
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                       Fр
                                                           SCS
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                       В
                                 0.96
                                           0.75
                                                   0.100
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B
                                 4.68
                                                   0.200
                                                          56
                                           0.75
 MOBILE HOME PARK
                        В
                                 8.89
                                                   0.250
                                           0.75
                                                           56
 PUBLIC PARK
                                  7.80
                                           0.75
                                                   0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                                 0.17
                                           0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.444
 SUBAREA AREA(ACRES) = 22.50
                                 SUBAREA RUNOFF (CFS) = 33.53
 EFFECTIVE AREA(ACRES) = 296.76 AREA-AVERAGED Fm(INCH/HR) = 0.17
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.22
 TOTAL AREA (ACRES) = 296.8
                                   PEAK FLOW RATE (CFS) = 486.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.41 HALFSTREET FLOOD WIDTH(FEET) = 76.05
 FLOW VELOCITY (FEET/SEC.) = 5.13 DEPTH*VELOCITY (FT*FT/SEC.) = 7.22
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 81.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.04
 PIPE-FLOW(CFS) = 431.36
 PIPEFLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 26.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.039
```

File name: LR0215ZZ.RES

Page 51

Date: 04/21/2014

```
SUBAREA AREA (ACRES) = 22.50 SUBAREA RUNOFF (CFS) = 34.56
                     296.8
                                PEAK FLOW RATE (CFS) = 500.28
 TOTAL AREA (ACRES) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 68.92
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 39.69
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21583.00 = 6776.25 FEET.
*****************
 FLOW PROCESS FROM NODE 21583.00 TO NODE 21584.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1105.00 DOWNSTREAM ELEVATION(FEET) = 1099.00
 STREET LENGTH (FEET) = 1300.05 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   508.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.51
   HALFSTREET FLOOD WIDTH (FEET) = 81.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.92
 STREET FLOW TRAVEL TIME (MIN.) = 4.72 Tc (MIN.) = 31.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.848
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                                9.80
                                         0.75
                                                 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.02
                                         0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.101
 SUBAREA AREA(ACRES) = 9.82 SUBAREA RUNOFF(CFS) = 15.66
 EFFECTIVE AREA(ACRES) = 306.58 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.22
 TOTAL AREA (ACRES) = 306.6 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                ** PEAK FLOW RATE TABLE **
                                                                                       Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                    HEADWATER
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 DEPTH(FEET) = 1.50 HALFSTREET FLOOD WIDTH(FEET) = 80.74
                                                                                1 726.52 19.37 2.463 0.75(0.25) 0.33 357.6 21560.00
                                                                                        818.80 28.59 1.950 0.75(0.25) 0.33 525.4 21570.00
 FLOW VELOCITY (FEET/SEC.) = 4.56 DEPTH*VELOCITY (FT*FT/SEC.) = 6.85
                                                                                        810.32 29.57 1.911 0.75(0.25) 0.33 532.7 21540.00
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
                                                                               COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                               PEAK FLOW RATE (CFS) = 818.80 Tc (MIN.) = 28.59
                                                                               EFFECTIVE AREA(ACRES) = 525.36 AREA-AVERAGED Fm(INCH/HR) = 0.25
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 ASSUME FULL-FLOWING PIPELINE
                                                                               TOTAL AREA (ACRES) =
                                                                                                  532.7
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.64
                                                                               LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21584.00 = 8133.08 FEET.
 PIPE-FLOW(CFS) = 439.49
                                                                              ******************
 PIPEFLOW TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 28.59
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.950
                                                                               FLOW PROCESS FROM NODE 21584.00 TO NODE 21585.00 IS CODE = 63
 SUBAREA AREA(ACRES) = 9.82 SUBAREA RUNOFF(CFS) = 16.57
                                                                              ______
 TOTAL AREA (ACRES) = 306.6 PEAK FLOW RATE (CFS) = 500.28
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               UPSTREAM ELEVATION(FEET) = 1099.00 DOWNSTREAM ELEVATION(FEET) = 1098.00
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                               STREET LENGTH (FEET) = 1435.00 CURB HEIGHT (INCHES) = 8.0
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                               STREET HALFWIDTH (FEET) = 32.00
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 60.79
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
   STREET FLOW DEPTH (FEET) = 0.82
                                                                               INSIDE STREET CROSSFALL (DECIMAL) = 0.020
   HALFSTREET FLOOD WIDTH (FEET) = 40.78
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.59
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.12
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 21570.00 TO NODE 21584.00 = 8076.30 FEET.
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
*****
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 21584.00 TO NODE 21584.00 IS CODE = 1
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 863.36
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                 ***STREET FLOWING FULL***
_____
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TOTAL NUMBER OF STREAMS = 3
                                                                                 STREET FLOW DEPTH (FEET) = 2.62
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 129.85
 TIME OF CONCENTRATION (MIN.) = 28.59
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.62
 RAINFALL INTENSITY (INCH/HR) = 1.95
                                                                                 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 6.88
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 9.12 Tc (MIN.) = 37.71
 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                               * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.652
 AREA-AVERAGED Ap = 0.22
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 EFFECTIVE STREAM AREA(ACRES) = 306.58
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fp
                                                                                                                                    SCS
 TOTAL STREAM AREA(ACRES) = 306.58
                                                                                   LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 500.28
                                                                               RESIDENTIAL
                                                                               ".4 DWELLING/ACRE" B 0.20 0.75 0.900
                                                                                                                                     56
 ** CONFLUENCE DATA **
                                                                               RESIDENTIAL
                                                                               "5-7 DWELLINGS/ACRE"
                                                                                                   B 4.29 0.75 0.500
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                               COMMERCIAL
                                                                                                    В
                                                                                                          59.18
                                                                                                                     0.75 0.100 56
    1
          310.12 29.57 1.911 0.75(0.37) 0.49 220.8 21540.00
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
          14.56 19.37 2.463 0.75(0.30) 0.40
                                               5.3 21560.00
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.129
          500.28 28.59 1.950 0.75(0.16) 0.22
    3
                                               306.6 21570.00
                                                                               SUBAREA AREA (ACRES) = 63.67 SUBAREA RUNOFF (CFS) = 89.09
                                                                               EFFECTIVE AREA(ACRES) = 589.03 AREA-AVERAGED Fm(INCH/HR) = 0.23
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.31
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 3 STREAMS.
                                                                               TOTAL AREA (ACRES) = 596.3 PEAK FLOW RATE (CFS) = 818.80
                                                                               NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

Date: 04/21/2014 File name: LR0215ZZ.RES Page 53 Date: 04/21/2014 File name: LR0215ZZ.RES Page 54

```
PIPE-FLOW(CFS) = 822.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 2.57 HALFSTREET FLOOD WIDTH(FEET) = 127.35
 FLOW VELOCITY (FEET/SEC.) = 2.59 DEPTH*VELOCITY (FT*FT/SEC.) = 6.66
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                   RESIDENTIAL
                                                                                   ".4 DWELLING/ACRE"
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                   PUBLIC PARK
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                   COMMERCIAL
 ESTIMATED PIPE DIAMETER (INCH) = 120.00 NUMBER OF PIPES = 2
                                                                                   RESIDENTIAL
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 5.12
 PIPE-FLOW(CFS) = 805.26
 PIPEFLOW TRAVEL TIME (MIN.) = 4.67 Tc (MIN.) = 33.26
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.781
 SUBAREA AREA(ACRES) = 63.67 SUBAREA RUNOFF(CFS) = 96.50
 TOTAL AREA (ACRES) = 596.3 PEAK FLOW RATE (CFS) = 822.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 16.79
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
  HALFSTREET FLOOD WIDTH (FEET) = 33.03
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 0.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.70
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1435.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 119.1 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21585.00
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 735.57 24.04 2.164 0.75(0.22) 0.30 421.3 21560.00
           822.04 33.26 1.781 0.75(0.23) 0.31 589.0 21570.00
     3
           814.86 34.24 1.750 0.75(0.23) 0.31
                                                 596.3 21540.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 822.04 Tc (MIN.) = 33.26
 AREA-AVERAGED Fm(INCH/HR) = 0.23 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                                   ** PEAK FLOW RATE TABLE **
 AREA-AVERAGED Ap = 0.31 EFFECTIVE AREA(ACRES) = 589.03
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21585.00 = 9568.08 FEET.
                                                                                    NUMBER
                                                                                    1
*****************
 FLOW PROCESS FROM NODE 21585.00 TO NODE 21586.00 IS CODE = 33
                                                                                   NEW PEAK FLOW DATA ARE:
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1098.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1079.00
 FLOW LENGTH (FEET) = 1296.52 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 90.0 INCH PIPE IS 65.8 INCHES
                                                                                   >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
```

Page 55

Date: 04/21/2014

File name: LR0215ZZ.RES

PIPE-FLOW VELOCITY(FEET/SEC.) = 23.76\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 34.24\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.750 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Aρ SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN B 2.53 0.75 0.900 B 0.25 0.75 0.850 56 B 22.40 0.75 0.100 56 "5-7 DWELLINGS/ACRE" B 0.54 0.75 0.500 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194 SUBAREA AREA (ACRES) = 25.72 SUBAREA RUNOFF (CFS) = 37.15 EFFECTIVE AREA(ACRES) = 614.75 AREA-AVERAGED Fm(INCH/HR) = 0.23 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30TOTAL AREA(ACRES) = 622.1 PEAK FLOW RATE(CFS) = 842.92 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75STREET CROSS-SECTION INFORMATION: CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 20.87 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.51HALFSTREET FLOOD WIDTH (FEET) = 17.59 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.18 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.62 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 761.45 25.03 2.112 0.75(0.22) 0.29 447.0 21560.00 842.92 34.24 1.750 0.75 (0.23) 0.30 614.7 21570.00 835.57 35.22 1.721 0.75(0.23) 0.31 622.1 21540.00 PEAK FLOW RATE (CFS) = 842.92 Tc (MIN.) = 34.24 AREA-AVERAGED Fm(INCH/HR) = 0.23 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30 EFFECTIVE AREA(ACRES) = 614.75 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21586.00 = 10864.60 FEET. FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 11

```
** MAIN STREAM CONFLUENCE DATA **
  STREAM
           0
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         761.45 25.03 2.112 0.75(0.22) 0.29 447.0 21560.00
         842.92 34.24 1.750 0.75(0.23) 0.30 614.7 21570.00
         835.57 35.22 1.721 0.75(0.23) 0.31 622.1 21540.00
 LONGEST FLOWPATH FROM NODE 21540.00 TO NODE 21586.00 = 10864.60 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 7581.33 Tc (MIN.) = 60.11
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.48
 TOTAL AREA(ACRES) = 14728.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21586.00 = 58318.40 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.61;24H= 5.71
 S-GRAPH: VALLEY(DEV.) = 79.0%; VALLEY(UNDEV.)/DESERT= 21.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.45; Ybar = 0.47
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.58; 30M = 0.60; 1HR = 0.61;
 3HR = 0.91; 6HR = 0.96; 24HR = 0.97
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 15350.1
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21586.00 = 58318.40 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0230; Lca/L=0.4,n=.0206; Lca/L=0.5,n=.0189; Lca/L=0.6,n=.0177
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3876.07
 PEAK FLOW RATE (CFS) = 7852.50
********************
 FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
********************
 FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21586.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 15350.1 TC (MIN.) =
 AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.47
 PEAK FLOW RATE (CFS) = 7852.50
______
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

\_\_\_\_\_

Date: 04/21/2014 File name: LR0215ZZ.RES Page 57 Date: 04/21/2014 File name: LR0215ZZ.RES Page 58

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21651

\* 100-YR HC ULTIMATE CONDITION OCT 2013 IESCOBAR

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0216ZZ.DAT

TIME/DATE OF STUDY: 14:17 02/28/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 100.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

File name: LR0216ZZ.RES

17	20.0	10.0	0.020/0.020	/0.020	0.50	1.50 0.031	2 0.125	0.0180
18	26.0	15.0	0.020/0.020	/0.020	0.67	2.00 0.031	2 0.167	0.0180
19	52.0	20.0	0.020/0.020	1/0.020	0.67	2.00 0.031	2 0.167	0.0180
*S 0: *U	1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T SER-SPECI	ve Flow- aximum Al a)*(Veloc WITH A F O THE UF	-DEPTH CONSTRA- -Depth = 0.20 -Depth = 0.20 -Dep	FEET  of Flow Do  ont = 6.  GREATER  CARY PIPE  PHIC SLOPE	) (FT*FT/ THAN .* E ADJUSTM	S)		
			DEL SELECTIONS 0.80 * Tc	S/PARAMET	ERS:			
			EVELOPED" S-GR	APH FOR	DEVELOPME	NTS OF		
			LESS; AND "VA					
			OF 2 UNITS/AC					
	PRECIPITA	ATION DAT	TA ENTERED ON	SUBAREA 1	BASIS.			
	SIERRA MA	ADRE DEPI	TH-AREA FACTOR	RS USED.				
*AN	TECEDENT	MOISTURE	E CONDITION (A	MC) II A	SSUMED FO	R UNIT HYD	ROGRAPH	METHOD
		******	******	*****	******	******	*****	*****
FL	OW PROCES	SS FROM N	NODE 21600.00	TO NODE	21601.0	0 IS CODE	= 21	
							= 21 	
>>	>>>RATION	IAL METHO	DD INITIAL SUB	BAREA ANA	 LYSIS<<<<	<		
>> >>	>>>RATION	NAL METHO	DD INITIAL SUB	BAREA ANA	LYSIS<<<<	<pre>&lt; SUBAREA&lt;</pre>		
>> >> >>	>>>RATION USE TIME-	IAL METHO	DD INITIAL SUB	BAREA ANA	LYSIS<	<pre>&lt; SUBAREA&lt;</pre>		
>> >> >> IN	>>>RATION USE TIME- ====================================	IAL METHO OF-CONCE	DD INITIAL SUB ENTRATION NOMC ======= DW-LENGTH(FEET	BAREA ANA BGRAPH FO BEEFFERENCE BY 190	LYSIS<<<< R INITIAL	<pre>SUBAREA&lt;&lt;</pre>		
>> >> >> IN	>>>RATION USE TIME- ====================================	IAL METHO OF-CONCE	DD INITIAL SUB	BAREA ANA BGRAPH FO BEEFFERENCE BY 190	LYSIS<<<< R INITIAL	<pre>SUBAREA&lt;&lt;</pre>		
 >> >> IN EL	>>>RATION USE TIME- ======== ITIAL SUE EVATION I	NAL METHO OF-CONCE BAREA FLO DATA: UPS	DD INITIAL SUB ENTRATION NOMC  DW-LENGTH(FEET STREAM(FEET) =	BAREA ANA OGRAPH FO 	LYSIS <ss initial="" of="" state="" td="" th<="" the="" to=""><td><pre> <ul> <li>SUBAREA&lt;</li> <li>====================================</li></ul></pre></td><td></td><td>  )79.00</td></ss>	<pre> <ul> <li>SUBAREA&lt;</li> <li>====================================</li></ul></pre>		  )79.00
>> >> IN EL	>>>RATION USE TIME- ======= ITIAL SUE EVATION [ = K*[(LE	NAL METHO OF-CONCE BAREA FLO DATA: UPS	DD INITIAL SUB ENTRATION NOMC  DW-LENGTH(FEET STREAM(FEET) = 3.00)/(ELEVATI	BAREA ANA DGRAPH FOI DGRAPH FOI D	LYSIS<<<< R INITIAL B. 50.54 DOWNS  E)]**0.20	<pre>&lt; SUBAREA&lt;&lt; ===================================</pre>		  )79.00
>> >> IN EL	>>>RATION USE TIME- ======== ITIAL SUF EVATION I  = K*[(LE BAREA ANA	VAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3	DD INITIAL SUB ENTRATION NOMC  DW-LENGTH(FEET STREAM(FEET) =	SAREA ANA: OGRAPH FO:	LYSIS<<<< R INITIAL ======= 0.54 00 DOWNS E)]**0.20 9.857	<pre>&lt; SUBAREA&lt;&lt; ===================================</pre>		  079.00
>> >> IN EL Tc SU	>>>RATION USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA 100 YEAR	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 RAINFALI	DD INITIAL SUB ENTRATION NOME DW-LENGTH (FEET STREAM (FEET) = 8.00)/(ELEVATI	BAREA ANA GRAPH FOI 1) = 90 1100. CON CHANGE (MIN.) = ICH/HR) =	LYSIS<<<< R INITIAL ======= 0.54 00 DOWNS E)]**0.20 9.857	<pre>&lt; SUBAREA&lt;&lt; ===================================</pre>		 
 >> >> IN EL Tc SU *	>>>RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC	NAL METHO -OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALYSIS US RAINFALI AND LOSS	DD INITIAL SUB ENTRATION NOME DW-LENGTH (FEET STREAM (FEET) = 3.00)/(ELEVATI SED MINIMUM TO L INTENSITY (IN	BAREA ANA OGRAPH FOI OGRAPH FOI OGRAPH FOI OGRAPH FOI OGRAPH FOI OGRAPH FOI OGRAPH OGR	LYSIS<<<< R INITIAL	<pre>&lt; SUBAREA&lt;&lt; ===================================</pre>	) = 10	
 >> >> IN EL Tc SU *	>>>RATION USE TIME- ====================================	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALLYSIS US RAINFALI AND LOSS	DD INITIAL SUBENTRATION NOMO  DW-LENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATI SEED MINIMUM TO L INTENSITY (IN S RATE DATA (AM SCS SOIL	PAREA ANA DGRAPH FOR D	2.54 0.54 0.0 DOWNS 2.)]**0.20 9.857 3.695	<pre>&lt; SUBAREA&lt;&lt; ======= TREAM(FEET</pre>	) = 10	Tc
 >> >> IN EL Tc SU: *	>>>RATION USE TIME- ====================================	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALLYSIS US RAINFALI AND LOSS	DD INITIAL SUB ENTRATION NOME DW-LENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATI SED MINIMUM TO L INTENSITY (IN S RATE DATA (AM	AREA ANA: OGRAPH FO: O	LYSIS<<<< R INITIAL B.54 DO DOWNS  E)]**0.20 9.857 3.695  Fp (INCH/H	<pre>&lt; SUBAREA&lt;&lt; ======= TREAM(FEET</pre>	======= ) = 1( SCS (AL) CN	Tc (MIN.
>>>>>>> IN ELL TC SU *	>>>RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALI AND LOSS IT TYPE/ JSE	DD INITIAL SUB ENTRATION NOMO DW-LENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATI SED MINIMUM TO INTENSITY (IN S RATE DATA (AM SCS SOII GROUP	AREA ANA: OGRAPH FO: O	LYSIS<<<< R INITIAL B.54 DO DOWNS  E)]**0.20 9.857 3.695  Fp (INCH/H	<pre>SUBAREA&lt;</pre> TREAM(FEET  Ap R) (DECIM	======= ) = 1( SCS AL) CN	Tc (MIN.
 >> >>> IN EL Tc SU * SU D	>>> RATION USE TIME- ====================================	NAL METHO OF-CONCE AREA FLO ATA: UPS CNGTH** 3 ALYSIS US ALYSIS US RAINFALI AND LOSS IT TYPE/ USE	DD INITIAL SUBENTRATION NOMCOMPLENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATION SEED MINIMUM TO LINTENSITY (IN SCS SOIL GROUP B	AREA ANA: OGRAPH FO: O	LYSIS<<<< R INITIAL	<pre>SUBAREA&lt;</pre> TREAM(FEET  Ap R) (DECIM	======= ) = 1( scs (AL) CN 0 56	Tc (MIN. 13.3
>>>> IN ELL Tc SU. * SU. D SC RE	>>> RATION USE TIME- ====================================	NAL METHO OF-CONCE SAREA FLO NATA: UPS CNGTH** 3 ALYSIS US RAINFALI AND LOSS IT TYPE/ USE JG/ACRE"	DD INITIAL SUBENTRATION NOMCOMPLENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATION NOME SEED MINIMUM TO LINTENSITY (IN SCRIPT DATA (AM GROUP B	AREA ANA: OGRAPH FO: O	LYSIS<<<< R INITIAL	SUBAREA<< SUBAREA  TREAM(FEET  Ap R) (DECIM 5 0.60	======= ) = 1( scs (AL) CN 0 56	Tc (MIN. 13.3
>>> >> IN ELL Tc SU * SU D SC RE ". AG	>>> RATION USE TIME- ====================================	NAL METHO OF-CONCE SAREA FLO NATA: UPS CNGTH** 3 ALYSIS US RAINFALI AND LOSS IT TYPE/ USE JG/ACRE"	DD INITIAL SUBENTRATION NOMCOMPLENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATION NOME SEED MINIMUM TO LINTENSITY (IN SCRIPT DATA (AM GROUP B	AREA ANA: GRAPH FO: SINGLE   90   GRAPH FO: GR	LYSIS<<<< R INITIAL B. S.	SUBAREA<< ===================================	======= ) = 10 SCS AL) CN 0 56 0 56	Tc (MIN. 13.3
>>> >> IN ELL  TC SU: * SU D  SC RE ". AGG"0	>>> RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANF 100 YEAR BAREA TC EVELOPMEN LAND I HOOL SIDENTIAI 4 DWELLIN RICULTURF	NAL METHO OF-CONCE BAREA FLO OATA: UPS CNGTH** 3 ALYSIS US RAINFALI AND LOSS UT TYPE/ USE JG/ACRE" AL FAIR C	DD INITIAL SUBENTRATION NOMCOMPLENGTH (FEET STREAM (FEET) = 3.00) / (ELEVATION NOME SEED MINIMUM TO SEED MINIMUM TO SEED MINIMUM TO SEED SOIL GROUP B	AREA ANA: GRAPH FO: SINGLE   90   GRAPH FO: GR	LYSIS<<<< R INITIAL	SUBAREA<< ===================================	SCS AL) CN 0 56	Tc (MIN. 13.3
>>> >>> IN ELL TC SU * SU D. SC RE ". AGG "O CO.	>>> RATION USE TIME- ======== ITIAL SUF EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND I HOOL SIDENTIAI 4 DWELLIN RICULTURA RCHARDS"	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALYSIS US RAINFALI AND LOSS UT TYPE/ JSE JG/ACRE" AL FAIR C	DD INITIAL SUBENTRATION NOME  DW-LENGTH (FEET  BTREAM (FEET) =  B.00) / (ELEVATI  BED MINIMUM TO  L INTENSITY (IN  SCS SOIL  GROUP  B  B  COVER  B  B	AREA ANA: GRAPH FO: SINGRAPH FO	LYSIS<<<< R INITIAL B. S.	SUBAREA<< ===================================	SCS AL) CN 0 56 0 56 0 65 0 56	Tc (MIN. 13.3 15.7 22.8 9.8
>>> >>> IN ELL TC SU SU SC RE ". AG "O CO MO	>>> RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANF 100 YEAR BAREA TC EVELOPMEN LAND I HOOL SIDENTIAI 4 DWELLIN RICULTURA RCHARDS"	NAL METHO OF-CONCE BAREA FLO OATA: UPS CNGTH** 3 ALYSIS US RAINFALL AND LOSS UT TYPE/ USE JG/ACRE" AL FAIR C	DD INITIAL SUBENTRATION NOME  DW-LENGTH (FEET  BTREAM (FEET) =  B.00) / (ELEVATI  BED MINIMUM TO  L INTENSITY (IN  SCS SOIL  GROUP  B  B  COVER  B  B	AREA ANA: GRAPH FO: SINGRAPH FO	LYSIS<<<< R INITIAL B. S.	SUBAREA<< =======  TREAM(FEET  Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10	SCS AL) CN 0 56 0 56 0 65 0 56	Tc (MIN. 13.3 15.7 22.8 9.8
>>> IN EL TC SUL * SUL DL SC RE RE ". AGG "O CO. MO RE "5	>>> RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U HOOL SIDENTIAI 4 DWELLIN RICULTURA RCHARDS" MMERCIAL BILE HOME SIDENTIAI -7 DWELLII -7 DWELLII	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE JIG/ACRE" LL FAIR CO C PARK LNGS/ACRE	DD INITIAL SUBENTRATION NOMCESSES OF STREAM (FEET) = B.00) / (ELEVATION SED MINIMUM TO LINTENSITY (IN SCS SOIL GROUP B  B  COVER  B  B  B  COVER  B  B  COVER  B  B  COVER  B  B  B  COVER  COVER  B  COVER  COVER  B  COVER	CON CHANG: (CON CH	P. C.	Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10 5 0.25 5 0.50	SCS AL) CN 0 56 0 56 0 56 0 56	Tc (MIN. 13.3 15.7 22.8 9.8 10.8
>>> IN EL TC SUL * SUL DL SC RE RE ". AGG "O CO. MO RE "5	>>> RATION USE TIME- ======== ITIAL SUE EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U HOOL SIDENTIAI 4 DWELLIN RICULTURA RCHARDS" MMERCIAL BILE HOME SIDENTIAI -7 DWELLII -7 DWELLII	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE JIG/ACRE" LL FAIR CO C PARK LNGS/ACRE	DD INITIAL SUBENTRATION NOME  DW-LENGTH (FEET  BTREAM (FEET) =  B.00) / (ELEVATI  SED MINIMUM TO  INTENSITY (IN  SCS SOIL  GROUP  B  B  COVER  B  B  B	CON CHANG: (CON CH	P. C.	Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10 5 0.25 5 0.50	SCS AL) CN 0 56 0 56 0 56 0 56	Tc (MIN. 13.3 15.7 22.8 9.8 10.8
>>>> IN ELL TC SU SC RE ". AG MO RE "5 SU	>>> RATION USE TIME- ======= ITIAL SUF EVATION I  = K*[(LE BAREA ANA 100 YEAR BAREA TC EVELOPMEN LAND U HOOL SIDENTIAI 4 DWELLIN RICULTURA RCHARDS" MMERCIAL BILE HOME SIDENTIAI -7 DWELLIB BAREA AVE	NAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 LLYSIS US RAINFALL AND LOSS IT TYPE/ USE JIG/ACRE" LL FAIR CO C PARK LINGS/ACRE CRAGE PER	DD INITIAL SUBENTRATION NOMCESSES OF STREAM (FEET) = B.00) / (ELEVATION SED MINIMUM TO LINTENSITY (IN SCS SOIL GROUP B  B  COVER  B  B  B  COVER  B  B  COVER  B  B  COVER  B  B  B  COVER  COVER  B  COVER  COVER  B  COVER	CAREA ANA:  CORAPH FOR:  CON CHANG:  CON C	Tysis<<<< R INITIAL =======  9.54  00 DOWNS  E)]**0.20 9.857 3.695  Fp (INCH/H 0.7  0.7  0.6 0.7  0.7	Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10 5 0.25 6 0.72	SCS AL) CN 0 56 0 56 0 56 0 56	Tc (MIN. 13.3 15.7 22.8 9.8 10.8
>>>> IN ELL TC SU SC RE ". AG MO RE "5 SU	>>> RATION USE TIME- ====================================	WAL METHO OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALLYSIS US RAINFALI AND LOSS RT TYPE/ JSE JG/ACRE" AL FAIR CO C PARK CNGS/ACRE CRAGE PER CRAGE PER CRAGE PER CRAGE PER	DD INITIAL SUBENTRATION NOMCESCOPE STREAM (FEET) = 0.00 / (ELEVATION SED MINIMUM TO SED MINIMUM TO SED MINIMUM TO SED MINIMUM TO SED MINIMUM SCS SOIL GROUP B B COVER B B B B B B B B B B B B B B B B B B B	CAREA ANA:  CORAPH FOR:  CON CHANG:  CON C	Tysis<<<< R INITIAL =======  9.54  00 DOWNS  E)]**0.20 9.857 3.695  Fp (INCH/H 0.7  0.7  0.6 0.7  0.7	Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10 5 0.25 6 0.72	SCS AL) CN 0 56 0 56 0 56 0 56	Tc (MIN. 13.3 15.7 22.8 9.8 10.8
	>>>> RATION USE TIME- ====================================	WAL METHO OF-CONCE SAREA FLO OATA: UPS CNGTH** 3 ALYSIS US RAINFALL AND LOSS IT TYPE/ USE JOSE JOSE CPARK CNGS/ACRE CRAGE PER	DD INITIAL SUBENTRATION NOME  DW-LENGTH (FEET STREAM (FEET) =  3.00) / (ELEVATI SCED MINIMUM TO LINTENSITY (IN SCS SOIL GROUP B  B  COVER B B B COVER B	AREA ANA:  OGRAPH FO:  1) = 90  1100.  CON CHANG:  (MIN.) =  ICH/HR) =  IC II):  AREA (ACRES) 0.43  1.53  0.70 2.31 0.43  0.53  ATE, FP(II)  RACTION,	Tysis<<<< rp>R INITIAL 3.54 00 DOWNS 2)]**0.20 9.857 3.695  Fp (INCH/H 0.7 0.7 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	Ap R) (DECIM 5 0.60 5 0.90 3 1.00 5 0.10 5 0.25 6 0.72	SCS AL) CN 0 56 0 56 0 56 0 56 0 56	Tc (MIN. 13.3 15.7 22.8 9.8 10.8

FLOW PROCESS FROM NODE 21601.00 TO NODE 21602.00 IS CODE = 92

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<

	AGRICULTURAI
UPSTREAM NODE ELEVATION(FEET) = 1079.00	"ORCHARDS"
DOWNSTREAM NODE ELEVATION(FEET) = 1078.00	SCHOOL
CHANNEL LENGTH THRU SUBAREA(FEET) = 351.04	SUBAREA AVER
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.250	SUBAREA AVER
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150	TRAVEL TIME
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700	TRAVEL TIME
MAXIMUM DEPTH(FEET) = 1.00	AVERAGE FLOW
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.176	"V" GUTTER E
SUBAREA LOSS RATE DATA(AMC II):	SUBAREA AREA
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	EFFECTIVE AF
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	AREA-AVERAGE
RESIDENTIAL	TOTAL AREA (A
"8-10 DWELLINGS/ACRE" B 0.25 0.75 0.400 56	
RESIDENTIAL	SUBAREA AREA
".4 DWELLING/ACRE" B 2.17 0.75 0.900 56 SCHOOL B 0.70 0.75 0.600 56	5M = 0.46;
SCHOOL B 0.70 0.75 0.600 56	
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	END OF SUBAR
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.793	DEPTH (FEET)
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 21.47	FLOW VELOCIT
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 2.07	LONGEST FLOW
AVERAGE FLOW DEPTH(FEET) = 0.73 FLOOD WIDTH(FEET) = 47.88	
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 2.83 Tc(MIN.) = 12.69	******
SUBAREA AREA (ACRES) = 3.12 SUBAREA RUNOFF (CFS) = 7.25	FLOW PROCESS
SUBAREA AREA(ACRES) = 3.12 SUBAREA RUNOFF(CFS) = 7.25 EFFECTIVE AREA(ACRES) = 9.05 AREA-AVERAGED FM(INCH/HR) = 0.44	
AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.60	>>>>COMPUTE
TOTAL AREA(ACRES) = 9.1 PEAK FLOW RATE(CFS) = 22.30	=========
	UPSTREAM NOI
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	DOWNSTREAM N
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75	CHANNEL LENC
	"V" GUTTER V
END OF SUBAREA "V" GUTTER HYDRAULICS:	PAVEMENT LI
DEPTH(FEET) = 0.74 FLOOD WIDTH(FEET) = 48.63	PAVEMENT CRO
FLOW VELOCITY(FEET/SEC.) = 2.09 DEPTH*VELOCITY(FT*FT/SEC) = 1.54	MAXIMUM DEPI
LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21602.00 = 1260.58 FEET.	* 100 YEAR F
	SUBAREA LOSS
******************	DEVELOPMENT
FLOW PROCESS FROM NODE 21602.00 TO NODE 21603.00 IS CODE = 92	LAND US
	RESIDENTIAL
>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA	PAVEMENT LIF PAVEMENT CRC MAXIMUM DEPT * 100 YEAR F SUBAREA LOSS DEVELOPMENT LAND US RESIDENTIAL "8-10 DWELLI SCHOOL AGRICULTURAI "ORCHARDS" NATURAL FAIF
	SCHOOL
UPSTREAM NODE ELEVATION(FEET) = 1078.00	AGRICULTURAI
DOWNSTREAM NODE ELEVATION(FEET) = 1077.00	"ORCHARDS"
CHANNEL LENGTH THRU SUBAREA(FEET) = 262.00	NATURAL FAIR
"V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.250	"OPEN BRUSH"
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150	MOBILE HOME
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700	RESIDENTIAL
MAXIMUM DEPTH(FEET) = 1.00	"5-7 DWELLIN
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.945	SUBAREA AVER
SUBAREA LOSS RATE DATA(AMC II):	SUBAREA AVER
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	TRAVEL TIME
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	TRAVEL TIME
RESIDENTIAL	AVERAGE FLOW
"8-10 DWELLINGS/ACRE" B 2.61 0.75 0.400 56	"V" GUTTER H
MOBILE HOME PARK B 2.16 0.75 0.250 56	SUBAREA AREA
COMMERCIAL B 1.99 0.75 0.100 56	EFFECTIVE AF
RESIDENTIAL	AREA-AVERAGE
".4 DWELLING/ACRE" B 1.42 0.75 0.900 56	TOTAL AREA (A
2 2.12 0.70 0.300 00	101112 111(2)11(1

Page 3

Date: 04/21/2014

File name: LR0216ZZ.RES

AGRICULTURAL FAIR COVER "ORCHARDS" SCHOOL SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS TRAVEL TIME COMPUTED USI TRAVEL TIME THRU SUBAREA AVERAGE FLOW DEPTH(FEET) "V" GUTTER FLOW TRAVEL T SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/HR TOTAL AREA(ACRES) =	B LOSS RATE, AREA FRACT NG ESTIMATH BASED ON V = 0.79 IME(MIN.) = 10.82 19.87	1.25 , Fp(IN FION, A ED FLOW VELOCIT FLOOD = 1.7 SUBAR AREA-	p = 0.481 (CFS) = Y(FEET/SEC.) WIDTH(FEET) 0 Tc(MIN.) EA RUNOFF(CF AVERAGED Fm(	0.600 72 34.89 = 2.57 = 55.2 = 14.3 S) = 25 INCH/HR)	56 0 9 .32 = 0.39
SUBAREA AREA-AVERAGED RA 5M = 0.46; 30M = 0.95; 1				2.25; 24H	R = 4.75
END OF SUBAREA "V" GUTTE DEPTH(FEET) = 0.85 FL FLOW VELOCITY(FEET/SEC.) LONGEST FLOWPATH FROM NO	OOD WIDTH(1 = 2.71	FEET) = DEPTH	*VELOCITY(FT		
**************************************	21603.00 TO	O NODE	21604.00 IS	CODE =	92
>>>>COMPUTE "V" GUTTER	FLOW TRAVE	L TIME	THRU SUBAREA	<<<<	
UPSTREAM NODE ELEVATION ( DOWNSTREAM NODE ELEVATIO CHANNEL LENGTH THRU SUBA "V" GUTTER WIDTH (FEET) = 0. PAVEMENT LIP (FEET) = 0. PAVEMENT CROSSFALL (DECIM MAXIMUM DEPTH (FEET) = * 100 YEAR RAINFALL INTE SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/	N(FEET) = REA(FEET) = 3.00 ( 100 MANN: AL NOTATION 1.00 NSITY(INCH, MC II): SCS SOIL	1076. = 267 GUTTER ING'S N N) = 0. /HR) =	00 .00 HIKE (FEET) = = .0150 01700 2.768 Fp	Ap	scs
LAND USE RESIDENTIAL	GROUP (A	ACRES)	(INCH/HR)	(DECIMAL)	CN
"8-10 DWELLINGS/ACRE" SCHOOL AGRICULTURAL FAIR COVER	В	4.96 0.49	0.75 0.75	0.400 0.600	56 56
	В	2.49	0.63	1.000	65
NATURAL FAIR COVER "OPEN BRUSH" MOBILE HOME PARK	B B	0.53 3.02	0.61 0.75	1.000 0.250	66 56
RESIDENTIAL "5-7 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS TRAVEL TIME COMPUTED USI TRAVEL TIME THRU SUBAREA AVERAGE FLOW DEPTH (FEET) "V" GUTTER FLOW TRAVEL T SUBAREA AREA(ACRES) =	LOSS RATE, AREA FRACT NG ESTIMATE BASED ON V = 0.91 IME(MIN.) =	, Fp(IN FION, A ED FLOW VELOCIT FLOOD = 1.5	p = 0.526 (CFS) = Y(FEET/SEC.) WIDTH(FEET) 6 Tc(MIN.)	58.80 = 2.85 = 68.6 = 15.9	4 5
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/HR TOTAL AREA(ACRES) =	) = 0.71	AREA-	AVERAGED Ap	= 0.53	

File name: LR0216ZZ.RES

Page 4

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.94 FLOOD WIDTH (FEET) = 72.97
 FLOW VELOCITY (FEET/SEC.) = 2.95 DEPTH*VELOCITY (FT*FT/SEC) = 2.79
 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21604.00 = 1789.58 FEET.
************************
 FLOW PROCESS FROM NODE 21604.00 TO NODE 21605.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1076.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1074.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 286.05
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.648
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                               6.10
                                        0.75
                                                0.400
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               1.99
                                        0.63
                                                1.000
                                                      65
                        В
 NATURAL FAIR COVER
                        В
                               1.73
                                        0.61
                                                1.000
                                                      66
 "OPEN BRUSH"
 MOBILE HOME PARK
                        В
                               2.69
                                        0.75
                                                0.250 56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B
                               0.57
                                        0.75
                                                0.900
                                                      56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.65
                                        0.75
                                                0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.559
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 82.69
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.92
 AVERAGE FLOW DEPTH(FEET) = 0.91 FLOOD WIDTH(FEET) = 69.39
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 17.17
 SUBAREA AREA(ACRES) = 13.73 SUBAREA RUNOFF(CFS) = 27.98
 EFFECTIVE AREA(ACRES) = 45.67 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.54
 TOTAL AREA(ACRES) = 45.7 PEAK FLOW RATE(CFS) =
                                                          93.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.94 FLOOD WIDTH(FEET) = 72.82
 FLOW VELOCITY (FEET/SEC.) = 4.02 DEPTH*VELOCITY (FT*FT/SEC) = 3.80
 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21605.00 = 2075.63 FEET.
*****************
 FLOW PROCESS FROM NODE 21605.00 TO NODE 21606.00 IS CODE = 92
```

UPSTREAM NODE ELEVATION (FEET) = 1074.00 DOWNSTREAM NODE ELEVATION (FEET) = 1072.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 319.04 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700 MAXIMUM DEPTH(FEET) = 1.00\* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.532 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" B 7.94 0.75 0.400 56 AGRICULTURAL FAIR COVER "ORCHARDS" В 1.87 0.63 1.000 65 NATURAL FAIR COVER "OPEN BRUSH" 1.70 0.61 1.000 66 RESIDENTIAL ".4 DWELLING/ACRE" В 3.94 0.75 0.900 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" B 0.64 0.75 0.500 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.660 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 108.22 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.99 AVERAGE FLOW DEPTH(FEET) = 1.00 FLOOD WIDTH(FEET) = 78.95 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 18.50 SUBAREA AREA(ACRES) = 16.09 SUBAREA RUNOFF (CFS) = 29.93EFFECTIVE AREA(ACRES) = 61.76 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.57 TOTAL AREA (ACRES) = 61.8 PEAK FLOW RATE (CFS) = 118.41 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75 \*\* PIPE SIZED TO MAXIMIZE V-GUTTER FLOW AT DOWNSTREAM NODE \*\* ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY (FEET/SEC.) = 5.25 PIPE-FLOW(CFS) = 16.51PIPEFLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 18.18 \* 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.559 SUBAREA AREA(ACRES) = 16.09 SUBAREA RUNOFF (CFS) = 30.32EFFECTIVE AREA(ACRES) = 61.76 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.54 AREA-AVERAGED Ap = 0.74 TOTAL AREA (ACRES) = 61.8 PEAK FLOW RATE (CFS) = 119.89 V-GUTTER HYDRAULICS BASED ON MAINLINE Tc : V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 103.38 END OF SUBAREA "V" GUTTER HYDRAULICS: DEPTH(FEET) = 0.98 FLOOD WIDTH(FEET) = 77.60 FLOW VELOCITY (FEET/SEC.) = 3.94 DEPTH\*VELOCITY (FT\*FT/SEC) = 3.88 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21606.00 = 2394.67 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21606.00 TO NODE 21607.00 IS CODE = 63

>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA

Date: 04/21/2014 File name: LR0216ZZ.RES Page 5 Date: 04/21/2014 File name: LR0216ZZ.RES Page 6

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.580

File name: LR0216ZZ.RES

Page 8

Date: 04/21/2014

Date: 04/21/2014 File name: LR0216ZZ.RES Page 7

PIPE-FLOW(CFS) =

```
SUBAREA AREA(ACRES) = 36.55
                                SUBAREA RUNOFF(CFS) = 59.52
 EFFECTIVE AREA(ACRES) = 129.81 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.65
 TOTAL AREA(ACRES) = 129.8
                                PEAK FLOW RATE (CFS) = 214.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.17 HALFSTREET FLOOD WIDTH(FEET) = 51.70
 FLOW VELOCITY (FEET/SEC.) = 3.95 DEPTH*VELOCITY (FT*FT/SEC.) = 4.64
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 8.03
 PIPE-FLOW(CFS) = 142.46
 PIPEFLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 21.21
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.333
 SUBAREA AREA (ACRES) = 36.55 SUBAREA RUNOFF (CFS) = 62.46
 TOTAL AREA (ACRES) = 129.8 PEAK FLOW RATE (CFS) = 224.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 82.18
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.85
   HALFSTREET FLOOD WIDTH (FEET) = 35.35
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.71
 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21608.00 = 3653.19 FEET.
******************
  FLOW PROCESS FROM NODE 21608.00 TO NODE 21621.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1065.00 DOWNSTREAM ELEVATION(FEET) = 1064.00
 STREET LENGTH (FEET) = 963.89 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 224.63
```

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.56
   HALFSTREET FLOOD WIDTH (FEET) = 70.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.46
 STREET FLOW TRAVEL TIME (MIN.) = 7.22 Tc (MIN.) = 28.44
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.956
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 129.81 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.65
                     129.8
 TOTAL AREA (ACRES) =
                                  PEAK FLOW RATE (CFS) = 224.63
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.56 HALFSTREET FLOOD WIDTH(FEET) = 70.81
 FLOW VELOCITY (FEET/SEC.) = 2.22 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.93
 PIPE-FLOW(CFS) = 189.76
 PIPEFLOW TRAVEL TIME (MIN.) = 3.26 Tc (MIN.) = 24.48
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141
 SUBAREA AREA(ACRES) = 0.00
                              SUBAREA RUNOFF (CFS) = 0.00
 TOTAL AREA(ACRES) = 129.8
                                PEAK FLOW RATE (CFS) = 224.63
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.03
 STREETFLOW HYDRAULICS BASED ON MAINLINE To:
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 34.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.82
   HALFSTREET FLOOD WIDTH (FEET) = 33.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.20
 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21621.00 = 4617.08 FEET.
******************
 FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.48
 RAINFALL INTENSITY (INCH/HR) = 2.14
 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.64
```

Date: 04/21/2014 File name: LR0216ZZ.RES

Page 10

Date: 04/21/2014 File name: LR0216ZZ.RES Page 9

```
AREA-AVERAGED Ap = 0.65
 EFFECTIVE STREAM AREA(ACRES) = 129.81
 TOTAL STREAM AREA(ACRES) = 129.81
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 224.63
FLOW PROCESS FROM NODE 21610.00 TO NODE 21611.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 741.08
 ELEVATION DATA: UPSTREAM(FEET) = 1080.00 DOWNSTREAM(FEET) = 1079.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 16.025
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.760
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           4.71
                                     0.75
                                             0.600 56 21.72
 RESIDENTIAL
                      B 1.82
                                     0.75
 "8-10 DWELLINGS/ACRE"
                                           0.400
                                                   56 19.71
 COMMERCIAL
                      В
                             0.99
                                     0.75
                                             0.100 56 16.02
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.486
 SUBAREA RUNOFF (CFS) = 16.22
 TOTAL AREA(ACRES) = 7.52 PEAK FLOW RATE(CFS) = 16.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*****************
 FLOW PROCESS FROM NODE 21611.00 TO NODE 21612.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1079.00 DOWNSTREAM ELEVATION(FEET) = 1078.00
 STREET LENGTH (FEET) = 186.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               22.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.56
  HALFSTREET FLOOD WIDTH (FEET) = 20.88
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.32
 STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 17.33
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.633
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В 3.69
                                         0.75
                                                 0.600
                                                         56
 RESIDENTIAL
                      B 1.54 0.75
 "8-10 DWELLINGS/ACRE"
                                                 0.400
                                                         56
                                0.81
                                        0.75 0.100
 COMMERCIAL
                         В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
 SUBAREA AREA(ACRES) = 6.04
                               SUBAREA RUNOFF (CFS) = 12.35
 EFFECTIVE AREA (ACRES) = 13.56 AREA-AVERAGED Fm (INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 13.6 PEAK FLOW RATE (CFS) =
                                                          27.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.59
 FLOW VELOCITY (FEET/SEC.) = 2.53 DEPTH*VELOCITY (FT*FT/SEC.) = 1.50
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 186.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 22.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21612.00
 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21612.00 = 927.08 FEET.
******************
 FLOW PROCESS FROM NODE 21612.00 TO NODE 21613.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1078.00 DOWNSTREAM ELEVATION(FEET) = 1077.00
 STREET LENGTH (FEET) = 171.57 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    32.90
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.69
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
 STREET FLOW TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 18.37
```

Date: 04/21/2014 File name: LR0216ZZ.RES Page 11

File name: LR0216ZZ.RES

Page 12

Date: 04/21/2014

* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.543 SUBAREA LOSS RATE DATA(AMC II):	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 3.80 0.75 0.600 56  RESIDENTIAL "8-10 DWELLINGS/ACRE" B 2.60 0.75 0.400 56
"3-4 DWELLINGS/ACRE" B 2.58 0.75 0.600 56 RESIDENTIAL	COMMERCIAL B 0.92 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
"8-10 DWELLINGS/ACRE" B 1.42 0.75 0.400 56	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466
COMMERCIAL B 1.19 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	SUBAREA AREA(ACRES) = 7.32 SUBAREA RUNOFF(CFS) = 13.58  EFFECTIVE AREA(ACRES) = 26.07 AREA-AVERAGED Fm(INCH/HR) = 0.35
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.431 SUBAREA AREA(ACRES) = 5.19 SUBAREA RUNOFF(CFS) = 10.37	AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47  TOTAL AREA(ACRES) = 26.1 PEAK FLOW RATE(CFS) = 48.33
EFFECTIVE AREA (ACRES) = 18.75 AREA-AVERAGED Fm (INCH/HR) = 0.35	TOTAL AREA (ACRES) - 20.1 FEAR FLOW RATE (CFS) - 40.55
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
TOTAL AREA(ACRES) = 18.8 PEAK FLOW RATE(CFS) = 36.99	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	END OF SUBAREA STREET FLOW HYDRAULICS:
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75	DEPTH (FEET) = 0.74 HALFSTREET FLOOD WIDTH (FEET) = 29.79 FLOW VELOCITY (FEET/SEC.) = 2.61 DEPTH*VELOCITY (FT*FT/SEC.) = 1.92
END OF SUBAREA STREET FLOW HYDRAULICS:	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.79	AND L = 262.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 24.1 CFS,
FLOW VELOCITY(FEET/SEC.) = 2.84 DEPTH*VELOCITY(FT*FT/SEC.) = 1.81 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,	WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21614.00 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21614.00 = 1360.69 FEET.
AND L = $171.6$ FT WITH ELEVATION-DROP = $1.0$ FT, IS $20.3$ CFS,	
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21613.00  LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21613.00 = 1098.65 FEET.	**************************************
****************	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
FLOW PROCESS FROM NODE 21613.00 TO NODE 21614.00 IS CODE = 63	>>>> (STREET TABLE SECTION # 5 USED) <<<<
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA <ccc>&gt;&gt;&gt; (STREET TABLE SECTION # 5 USED) CCCC</ccc>	UPSTREAM ELEVATION(FEET) = 1076.00 DOWNSTREAM ELEVATION(FEET) = 1075.00 STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
>>>> (STREET TABLE SECTION # 5 USED) <<<< 	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
>>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00 STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
>>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
>>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00 STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
>>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
>>>> (STREET TABLE SECTION # 5 USED) <<<<  UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
>>>> (STREET TABLE SECTION # 5 USED) <<<<  UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
>>>> (STREET TABLE SECTION # 5 USED) <<<<  UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39 ***STREET FLOWING FULL***
>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39
>>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39 ***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
>>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH (FEET) = 167.00 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 52.39  ***STREET FLOWING FULL***  STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70  HALFSTREET FLOOD WIDTH (FEET) = 28.20  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15
>>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH (FEET) = 167.00 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 52.39  ***STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70  HALFSTREET FLOOD WIDTH (FEET) = 28.20  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.22
>>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH (FEET) = 167.00 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 52.39  ***STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70  HALFSTREET FLOOD WIDTH (FEET) = 28.20  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME (MIN.) = 0.88 TC (MIN.) = 20.97
<pre>&gt;&gt;&gt;&gt;&gt;(STREET TABLE SECTION # 5 USED)</pre> UPSTREAM ELEVATION(FEET) = 1077.00 DOWNSTREAM ELEVATION(FEET) = 1076.00 STREET LENGTH(FEET) = 262.04 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.78 ***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.69 AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.55	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39  ***STREET FLOWING FULL***  STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.70  HALFSTREET FLOOD WIDTH(FEET) = 28.20  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.15  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME(MIN.) = 0.88 TC(MIN.) = 20.97  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.349
>>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH (FEET) = 167.00 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 52.39  ***STREET FLOWING FULL***  STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70  HALFSTREET FLOOD WIDTH (FEET) = 28.20  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15  PRODUCT OF DEPTHAVELOCITY (FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 20.97  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.349  SUBAREA LOSS RATE DATA (AMC II):
<pre>&gt;&gt;&gt;&gt; (STREET TABLE SECTION # 5 USED) &lt;&lt;&lt;&lt;</pre> UBSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00 STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.78 ***STREET FLOWING FULL*** STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.71 HALFSTREET FLOOD WIDTH (FEET) = 28.69 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.55 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.82	STREET LENGTH (FEET) = 167.00 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 52.39  ***STREET FLOWING FULL***  STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.70  HALFSTREET FLOOD WIDTH (FEET) = 28.20  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15  PRODUCT OF DEPTHAVELOCITY (FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 20.97  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.349  SUBAREA LOSS RATE DATA (AMC II):
UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.78  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH (FEET) = 0.71  HALFSTREET FLOWD WIDTH (FEET) = 28.69  AVERAGE FLOW VELOCITY (FT*FT/SEC.) = 2.55  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.82  STREET FLOW TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 20.09	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39  ***STREET FLOWING FULL***  STREET FLOW DEPTH(FEET) = 0.70  HALFSTREET FLOOD WIDTH(FEET) = 28.20  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.15  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME(MIN.) = 0.88 TC(MIN.) = 20.97  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.349  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
UPSTREAM ELEVATION (FEET) = 1077.00 DOWNSTREAM ELEVATION (FEET) = 1076.00  STREET LENGTH (FEET) = 262.04 CURB HEIGHT (INCHES) = 6.0  STREET HALFWIDTH (FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW (CFS) = 43.78  ***STREET FLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.71  HALFSTREET FLOOD WIDTH (FEET) = 28.69  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.55  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.82  STREET FLOW TRAVEL TIME (MIN.) = 1.72 TC (MIN.) = 20.09  * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.410	STREET LENGTH(FEET) = 167.00 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.39  ***STREET FLOWING FULL*** STREET FLOW DEPTH(FEET) = 0.70  HALFSTREET FLOW DEPTH(FEET) = 28.20  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.15  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.22  STREET FLOW TRAVEL TIME (MIN.) = 0.88 TC(MIN.) = 20.97  * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.349  SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

Date: 04/21/2014

File name: LR0216ZZ.RES

Page 14

Date: 04/21/2014

File name: LR0216ZZ.RES

Page 13

```
RESIDENTIAL.
                                                                                  TOTAL AREA (ACRES) = 38.6 PEAK FLOW RATE (CFS) =
 "8-10 DWELLINGS/ACRE" B 2.09 0.75 0.400 56
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.509
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 SUBAREA AREA (ACRES) = 4.59 SUBAREA RUNOFF (CFS) = 8.13
 EFFECTIVE AREA(ACRES) = 30.66 AREA-AVERAGED Fm(INCH/HR) = 0.35
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
                                                                                 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.71
                                                                                 FLOW VELOCITY (FEET/SEC.) = 3.33 DEPTH*VELOCITY (FT*FT/SEC.) = 2.51
 TOTAL AREA (ACRES) = 30.7
                               PEAK FLOW RATE (CFS) =
                                                                                 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                       AND L = 333.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 22.4 CFS,
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21616.00
                                                                                 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21616.00 = 1861.19 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                *******************
 DEPTH (FEET) = 0.72 HALFSTREET FLOOD WIDTH (FEET) = 28.75
 FLOW VELOCITY (FEET/SEC.) = 3.19 DEPTH*VELOCITY (FT*FT/SEC.) = 2.28
                                                                                  FLOW PROCESS FROM NODE 21616.00 TO NODE 21617.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21615.00 = 1527.69 FEET.
                                                                                ______
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 21615.00 TO NODE 21616.00 IS CODE = 63
                                                                                _____
______
                                                                                  UPSTREAM ELEVATION(FEET) = 1073.00 DOWNSTREAM ELEVATION(FEET) = 1071.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                 STREET LENGTH (FEET) = 271.50 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1075.00 DOWNSTREAM ELEVATION(FEET) = 1073.00
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 333.50 CURB HEIGHT (INCHES) = 6.0
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   70.12
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW DEPTH(FEET) = 0.75
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 30.34
   ***STREET FLOWING FULL***
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.66
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.74
   STREET FLOW DEPTH(FEET) = 0.74
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 23.90
   HALFSTREET FLOOD WIDTH (FEET) = 30.04
                                                                                 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.171
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.28
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.43
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
 STREET FLOW TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 22.67
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.242
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 4.01
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                         0.75
                                                                                                                                 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                        SCS
                                                                                 RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "8-10 DWELLINGS/ACRE" B 2.09
                                                                                                                         0.75 0.400
     LAND USE
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" B 4.75
                                         0.75
                                                 0.600 56
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.531
                                                                                 SUBAREA AREA (ACRES) = 6.10 SUBAREA RUNOFF (CFS) = 9.74
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 3.16
                                        0.75 0.400 56
                                                                                 EFFECTIVE AREA(ACRES) = 44.67 AREA-AVERAGED Fm(INCH/HR) = 0.37
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.520
                                                                                 TOTAL AREA (ACRES) = 44.7 PEAK FLOW RATE (CFS) = 72.55
 SUBAREA AREA (ACRES) = 7.91 SUBAREA RUNOFF (CFS) = 13.19
 EFFECTIVE AREA(ACRES) = 38.57 AREA-AVERAGED Fm(INCH/HR) = 0.36
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
```

65.25

56

Page 16

Date: 04/21/2014 Date: 04/21/2014 File name: LR0216ZZ.RES Page 15 File name: LR0216ZZ.RES

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.71
 FLOW VELOCITY (FEET/SEC.) = 3.70 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 271.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 18.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21617.00
 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21617.00 = 2132.69 FEET.
******************
 FLOW PROCESS FROM NODE 21617.00 TO NODE 21618.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1071.00 DOWNSTREAM ELEVATION (FEET) = 1069.00
 STREET LENGTH (FEET) = 310.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.42
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.81
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 25.35
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.096
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Аp
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.74 0.75 0.600 56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 1.94 0.75
                                                0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.542
 SUBAREA AREA (ACRES) = 6.68 SUBAREA RUNOFF (CFS) = 10.17
 EFFECTIVE AREA(ACRES) = 51.35 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 51.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.72
 FLOW VELOCITY (FEET/SEC.) = 3.60 DEPTH*VELOCITY (FT*FT/SEC.) = 2.86
```

```
AND L = 310.0 FT WITH ELEVATION-DROP = 2.0 FT, IS 19.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21618.00
 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21618.00 = 2442.69 FEET.
******************
 FLOW PROCESS FROM NODE 21618.00 TO NODE 21619.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1069.00 DOWNSTREAM ELEVATION(FEET) = 1066.00
 STREET LENGTH (FEET) = 414.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                    85.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 32.90
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.06
 STREET FLOW TRAVEL TIME (MIN.) = 1.80 Tc (MIN.) = 27.15
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.011
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.17 0.75 0.600
                                                         56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 2.17 0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
 SUBAREA AREA(ACRES) = 8.34 SUBAREA RUNOFF(CFS) = 12.02
 EFFECTIVE AREA(ACRES) = 59.69 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 59.7 PEAK FLOW RATE(CFS) =
                                                          87.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 33.27
 FLOW VELOCITY (FEET/SEC.) = 3.84 DEPTH*VELOCITY (FT*FT/SEC.) = 3.09
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 414.5 FT WITH ELEVATION-DROP = 3.0 FT, IS 22.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21619.00
 LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21619.00 = 2857.19 FEET.
```

\*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

Date: 04/21/2014 File name: LR0216ZZ.RES Page 17 Date: 04/21/2014 File name: LR0216ZZ.RES Page 18

```
PIPE-FLOW VELOCITY(FEET/SEC.) = 3.96
**********************
                                                                                PIPE-FLOW(CFS) =
                                                                                                 15.74
 FLOW PROCESS FROM NODE 21619.00 TO NODE 21620.00 IS CODE = 63
                                                                               PIPEFLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 28.54
                                                                               * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.952
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                SUBAREA AREA (ACRES) = 6.37 SUBAREA RUNOFF (CFS) = 8.93
                                                                               TOTAL AREA (ACRES) = 66.1 PEAK FLOW RATE (CFS) = 93.55
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1066.00 DOWNSTREAM ELEVATION(FEET) = 1065.00
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET LENGTH(FEET) = 329.03 CURB HEIGHT(INCHES) = 6.0
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET HALFWIDTH (FEET) = 18.00
                                                                               STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                               STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 77.81
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 ***STREET FLOWING FULL***
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 STREET FLOW DEPTH (FEET) = 0.89
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 37.60
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.68
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.39
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21620.00 = 3186.22 FEET.
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              ******************
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                FLOW PROCESS FROM NODE 21620.00 TO NODE 21621.00 IS CODE = 31
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                              ______
   ***STREET FLOWING FULL***
                                                                               >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
   STREET FLOW DEPTH (FEET) = 0.94
                                                                              _____
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1065.00 DOWNSTREAM(FEET) = 1064.00
   HALFSTREET FLOOD WIDTH (FEET) = 40.23
                                                                               FLOW LENGTH (FEET) = 255.17 MANNING'S N = 0.013
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.79
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.63
                                                                               DEPTH OF FLOW IN 51.0 INCH PIPE IS 40.1 INCHES
 STREET FLOW TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 29.12
                                                                               PIPE-FLOW VELOCITY (FEET/SEC.) = 7.82
                                                                               ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.929
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               PIPE-FLOW(CFS) = 93.55
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                                               PIPE TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 29.08
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LONGEST FLOWPATH FROM NODE 21610.00 TO NODE 21621.00 = 3441.39 FEET.
 COMMERCIAL
                     B 0.33 0.75 0.100 56
                                                                              *******************
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.54
                                       0.75
                                               0.600
                                                                               FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 1
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 1.50
                                     0.75
                                               0.400 56
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.527
                                                                              SUBAREA AREA(ACRES) = 6.37 SUBAREA RUNOFF(CFS) = 8.80
                                                                               TOTAL NUMBER OF STREAMS = 2
 EFFECTIVE AREA(ACRES) = 66.06 AREA-AVERAGED Fm(INCH/HR) = 0.38
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.51
                                                                               TIME OF CONCENTRATION (MIN.) = 29.08
 TOTAL AREA(ACRES) = 66.1 PEAK FLOW RATE(CFS) =
                                                                                RAINFALL INTENSITY (INCH/HR) = 1.93
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                               AREA-AVERAGED Ap = 0.51
                                                                               EFFECTIVE STREAM AREA(ACRES) = 66.06
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               TOTAL STREAM AREA(ACRES) = 66.06
 DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 40.23
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE = 93.55
 FLOW VELOCITY (FEET/SEC.) = 2.78 DEPTH*VELOCITY (FT*FT/SEC.) = 2.63
                                                                                ** CONFLUENCE DATA **
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                STREAM O To Intensity Fp(Fm) Ap Ae
                                                                                                                                     HEADWATER
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                NUMBER
                                                                                          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                 1
                                                                                         224.63 24.48 2.141 0.64(0.41) 0.65 129.8 21600.00
                                                                                         93.55 29.08 1.930 0.75(0.38) 0.51 66.1 21610.00
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
```

Date: 04/21/2014 File name: LR0216ZZ.RES Page 19

ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1

ASSUME FULL-FLOWING PIPELINE

Date: 04/21/2014 File name: LR0216ZZ.RES

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

Page 20

CONFLUENCE FORMULA USED FOR 2 STREAMS.
** PEAK FLOW RATE TABLE **
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
1 314.04 24.48 2.141 0.66(0.40) 0.60 185.4 21600.00
2 290.86 29.08 1.930 0.67(0.40) 0.60 195.9 21610.00
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE(CFS) = 314.04 Tc(MIN.) = 24.48  EFFECTIVE AREA(ACRES) = 185.40 AREA-AVERAGED Fm(INCH/HR) = 0.40  AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.60  TOTAL AREA(ACRES) = 195.9  LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21621.00 = 4617.08 FEET.
******************
FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 10
>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
**************************************
>>>>DEFINE MEMORY BANK # 2 <<<<
PEAK FLOWRATE TABLE FILE NAME: 21586.DNA
MEMORY BANK # 2 DEFINED AS FOLLOWS:
PEAK FLOW RATE (CFS) = 7852.50 Tc (MIN.) = 60.11
AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.47
TOTAL AREA (ACRES) = 15350.1
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21586.00 = 58318.40 FEET.
*******************
FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 14.0
>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
PEAK FLOW RATE (CFS) = 7852.50 Tc (MIN.) = 60.11
AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.47
TOTAL AREA (ACRES) = 15350.1 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21586.00 = 58318.40 FEET.
LONGEST FLOWPAIR FROM NODE 20120.00 TO NODE 21300.00 - 30310.40 FEET.
*********************
FLOW PROCESS FROM NODE 21586.00 TO NODE 21586.00 IS CODE = 12
>>>>CLEAR MEMORY BANK # 2 <<<<
**************************************
>>>>COMDUTE TRADETOTRAL CUANNET PLOW////
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1079.00 DOWNSTREAM(FEET) = 1064.00
Date: 04/21/2014 File name: LR0216ZZ.RES Page 21
Tago 21

CONFILIENCE FORMILLA LISED FOR 2 STREAMS

```
CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7852.50
 FLOW VELOCITY (FEET/SEC.) = 22.53 FLOW DEPTH (FEET) = 8.80
 TRAVEL TIME (MIN.) = 2.18 Tc (MIN.) = 62.29
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21621.00 = 61258.38 FEET.
*******************
 FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 62.29
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.222
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                             Αp
                                                   SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                    В
 "8-10 DWELLINGS/ACRE"
                             6.61
                                     0.75
                                             0.400
                                                    56
 COMMERCIAL
                      В
                            3.08
                                     0.75
                                             0.100
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             2.19
                                     0.75
                                             0.600
                                                    56
 SCHOOL
                      В
                             1.79
                                     0.75 0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                             0.73
                                     0.75 0.900 56
                      В
 PUBLIC PARK
                      В
                             0.69
                                     0.75 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.436
 SUBAREA AREA(ACRES) = 15.09
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.61;24H= 5.71
 S-GRAPH: VALLEY(DEV.) = 79.0%; VALLEY(UNDEV.)/DESERT= 21.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.45; Ybar = 0.47
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.58; 30M = 0.60; 1HR = 0.61;
 3HR = 0.91; 6HR = 0.96; 24HR = 0.97
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 15365.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21621.00 = 61258.38 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0228; Lca/L=0.4,n=.0204; Lca/L=0.5,n=.0187; Lca/L=0.6,n=.0175
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3879.65
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7612.72
 TOTAL AREA (ACRES) = 15365.2
                              PEAK FLOW RATE (CFS) = 7852.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 7852.50 Tc (MIN.) = 62.29
```

CHANNEL LENGTH THRU SUBAREA (FEET) = 2939.98 CHANNEL SLOPE = 0.0051

Date: 04/21/2014

File name: LR0216ZZ.RES

```
AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.47
                                                                              DEVELOPMENT TYPE/
                                                                                                SCS SOIL AREA
                                                                                                                  Fр
                                                                                                                           Αр
 TOTAL AREA(ACRES) = 15365.2
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21621.00 = 61258.38 FEET.
                                                                             COMMERCIAL
                                                                                                 В
                                                                                                          4.38
                                                                                                                  0.75
                                                                                                                          0.100
                                                                             RESIDENTIAL.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                             ".4 DWELLING/ACRE"
                                                                                                 в 0.29
                                                                                                                   0.75
                                                                                                                          0.900
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                             RESIDENTIAL
                                                                                                 B 27.30
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                             "8-10 DWELLINGS/ACRE"
                                                                                                                   0.75
                                                                                                                          0.400
                                                                                                        0.28
    1
          314.04 24.48 2.141 0.66(0.40) 0.60 185.4 21600.00
                                                                             MOBILE HOME PARK
                                                                                                 В
                                                                                                                  0.75 0.250
    2
          290.86 29.08 1.930 0.67 (0.40) 0.60 195.9 21610.00
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 LONGEST FLOWPATH FROM NODE 21600.00 TO NODE 21621.00 = 4617.08 FEET.
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.362
                                                                             SUBAREA AREA (ACRES) = 32.25
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             UNIT-HYDROGRAPH DATA:
 UNIT-HYDROGRAPH DATA:
                                                                             RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.60;24H= 5.70
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.60;24H= 5.70
                                                                             S-GRAPH: VALLEY (DEV.) = 79.1%; VALLEY (UNDEV.) / DESERT = 20.9%
 S-GRAPH: VALLEY (DEV.) = 79.0%; VALLEY (UNDEV.) / DESERT= 21.0%
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             Tc(HR) = 1.06; LAG(HR) = 0.85; Fm(INCH/HR) = 0.45; Ybar = 0.47
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.45; Ybar = 0.47
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             DEPTH-AREA FACTORS: 5M = 0.58; 30M = 0.60; 1HR = 0.61;
 DEPTH-AREA FACTORS: 5M = 0.58; 30M = 0.60; 1HR = 0.61;
                                                                             3HR = 0.91; 6HR = 0.96; 24HR = 0.97
 3HR = 0.91; 6HR = 0.96; 24HR = 0.97
                                                                             UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 15593.3
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 15561.0
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21649.00 = 63482.38 FEET.
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21621.00 = 61258.38 FEET.
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                              Lca/L=0.3,n=.0226; Lca/L=0.4,n=.0202; Lca/L=0.5,n=.0186; Lca/L=0.6,n=.0174
  Lca/L=0.3,n=.0228; Lca/L=0.4,n=.0204; Lca/L=0.5,n=.0187; Lca/L=0.6,n=.0175
                                                                             TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 3928.51
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3920.09
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7693.47
 PEAK FLOW RATE (CFS) = 7680.81
                                                                             TOTAL AREA (ACRES) = 15593.3 PEAK FLOW RATE (CFS) = 7852.50
   (UPSTREAM NODE PEAK FLOW RATE (CFS) = 7852.50)
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 PEAK FLOW RATE (CFS) USED = 7852.50
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
******************
                                                                             5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 FLOW PROCESS FROM NODE 21621.00 TO NODE 21621.00 IS CODE = 12
                                                                            *******************
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                             FLOW PROCESS FROM NODE 21649.00 TO NODE 21649.00 IS CODE = 1
______
                                                                             >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                            _____
                                                                             TOTAL NUMBER OF STREAMS = 3
 FLOW PROCESS FROM NODE 21621.00 TO NODE 21649.00 IS CODE = 54
                                                                             CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             PEAK FLOW RATE (CFS) = 7852.50 Tc (MIN.) = 63.85
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             AREA-AVERAGED Fm (INCH/HR) = 0.45 Ybar = 0.47
_____
                                                                             TOTAL AREA(ACRES) = 15593.3
 ELEVATION DATA: UPSTREAM(FEET) = 1064.00 DOWNSTREAM(FEET) = 1051.00
                                                                            *******************
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2224.00 CHANNEL SLOPE = 0.0058
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
                                                                             FLOW PROCESS FROM NODE 21630.00 TO NODE 21631.00 IS CODE = 21
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
                                                                            ______
 CHANNEL FLOW THRU SUBAREA(CFS) = 7852.50
                                                                             >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 FLOW VELOCITY (FEET/SEC.) = 23.67 FLOW DEPTH (FEET) = 8.50
                                                                             >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 TRAVEL TIME (MIN.) = 1.57 Tc (MIN.) = 63.85
                                                                            ______
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21649.00 = 63482.38 FEET.
                                                                             INITIAL SUBAREA FLOW-LENGTH (FEET) = 870.00
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1072.00 DOWNSTREAM(FEET) = 1071.00
******************
 FLOW PROCESS FROM NODE 21649.00 TO NODE 21649.00 IS CODE = 81
                                                                             Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
______
                                                                             SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 21.706
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.301
_____
                                                                             SUBAREA TC AND LOSS RATE DATA(AMC II):
 MAINLINE Tc(MIN.) = 63.85
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fρ
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.204
                                                                                 LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             RESIDENTIAL
```

Date: 04/21/2014

File name: LR0216ZZ.RES

Date: 04/21/2014 File name: LR021677.RFS Page 23 Page 24

SCS

56

56

```
"8-10 DWELLINGS/ACRE" B 8.40 0.75 0.400 56 21.71
                                                                              CHANNEL LENGTH THRU SUBAREA (FEET) = 305.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
                                                                              PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 SUBAREA RUNOFF(CFS) =
                    15.13
                                                                              PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
 TOTAL AREA(ACRES) = 8.40 PEAK FLOW RATE(CFS) = 15.13
                                                                              MAXIMUM DEPTH(FEET) = 1.00
                                                                              * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.181
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 2.96
                                                                               DEVELOPMENT TYPE/
                                                                                                SCS SOIL AREA
                                                                                                                 Fρ
                                                                                                                            Αp
                                                                                  LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
*******************
                                                                              RESIDENTIAL
                                                                              "8-10 DWELLINGS/ACRE" B 13.68 0.75
                                                                                                                                    56
 FLOW PROCESS FROM NODE 21631.00 TO NODE 21632.00 IS CODE = 92
                                                                                                                            0.400
                                                                                                   В 2.18 0.75
                                                                              MOBILE HOME PARK
                                                                                                                            0.250
                                                                                                                                    56
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                              RESIDENTIAL
                                                                              ".4 DWELLING/ACRE" B 1.97 0.75 0.900
______
 UPSTREAM NODE ELEVATION (FEET) = 1071.00
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 DOWNSTREAM NODE ELEVATION (FEET) = 1068.00
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.437
 CHANNEL LENGTH THRU SUBAREA (FEET) = 204.53
                                                                              TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                              TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.16
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                              AVERAGE FLOW DEPTH(FEET) = 0.80 FLOOD WIDTH(FEET) = 56.39
                                                                               "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 23.72
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
                                                                              SUBAREA AREA(ACRES) = 17.83
                                                                                                            SUBAREA RUNOFF(CFS) = 29.76
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.252
                                                                              EFFECTIVE AREA(ACRES) = 42.89 AREA-AVERAGED Fm(INCH/HR) = 0.31
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              TOTAL AREA (ACRES) = 42.9 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                      SCS
                                                                                                                                     72.14
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                               7.91
                                               0.400
                                                      56
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                       0.75
 MOBILE HOME PARK
                               6.40
                                       0.75
                                               0.250
                                                     56
                                                                              END OF SUBAREA "V" GUTTER HYDRAULICS:
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     B 2.07
                                       0.75
                                               0.900
                                                                              DEPTH(FEET) = 0.85 FLOOD WIDTH(FEET) = 61.32
                                                                              FLOW VELOCITY (FEET/SEC.) = 4.34 DEPTH*VELOCITY (FT*FT/SEC) = 3.67
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    в 0.28
                                     0.75 0.500
                                                                              LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21633.00 = 1380.03 FEET.
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.406
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                              FLOW PROCESS FROM NODE 21633.00 TO NODE 21634.00 IS CODE = 92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.32
 AVERAGE FLOW DEPTH(FEET) = 0.65 FLOOD WIDTH(FEET) = 38.32
                                                                              >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 22.50
                                                                             _____
 SUBAREA AREA(ACRES) = 16.66
                               SUBAREA RUNOFF(CFS) = 29.21
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1065.00
 EFFECTIVE AREA(ACRES) = 25.06 AREA-AVERAGED Fm(INCH/HR) = 0.30
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1061.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
                                                                              CHANNEL LENGTH THRU SUBAREA (FEET) = 335.83
                               PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) = 25.1
                                                        43.97
                                                                              "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                              PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.04
                                                                              MAXIMUM DEPTH(FEET) = 1.00
                                                                              * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.121
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 0.71 FLOOD WIDTH(FEET) = 45.79
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fр
 FLOW VELOCITY(FEET/SEC.) = 4.61 DEPTH*VELOCITY(FT*FT/SEC) = 3.29
                                                                                  LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21632.00 = 1074.53 FEET.
                                                                              RESIDENTIAL
                                                                              "8-10 DWELLINGS/ACRE"
                                                                                                  B 15.81
                                                                                                                    0.75
                                                                                                                            0.400
                                                                                                                                    56
в 0.95
                                                                              MOBILE HOME PARK
                                                                                                                    0.75
                                                                                                                            0.250
 FLOW PROCESS FROM NODE 21632.00 TO NODE 21633.00 IS CODE = 92
                                                                              RESIDENTIAL
______
                                                                              ".4 DWELLING/ACRE"
                                                                                                   В
                                                                                                          2.21 0.75
                                                                                                                            0.900
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.451
______
 UPSTREAM NODE ELEVATION (FEET) = 1068.00
                                                                              TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 87.37
 DOWNSTREAM NODE ELEVATION (FEET) = 1065.00
                                                                              TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.88
```

Page 25

Date: 04/21/2014

File name: LR0216ZZ.RES

Page 26

Date: 04/21/2014

File name: LR021677.RFS

```
AVERAGE FLOW DEPTH (FEET) = 0.87 FLOOD WIDTH (FEET) = 63.71
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.52
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 24.87
                                                                                   TOTAL AREA (ACRES) =
                                                                                                       78.0
                                                                                                                    PEAK FLOW RATE (CFS) = 123.23
 SUBAREA AREA(ACRES) = 18.97 SUBAREA RUNOFF(CFS) = 30.45
                                                                                   V-GUTTER HYDRAULICS BASED ON MAINLINE TC :
 EFFECTIVE AREA(ACRES) = 61.86 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                                                                   V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 77.53
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
 TOTAL AREA (ACRES) = 61.9 PEAK FLOW RATE (CFS) =
                                                                                   END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                          100.24
                                                                                   DEPTH(FEET) = 0.98 FLOOD WIDTH(FEET) = 77.16
                                                                                   FLOW VELOCITY (FEET/SEC.) = 2.99 DEPTH*VELOCITY (FT*FT/SEC) = 2.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                   LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21635.00 = 1993.39 FEET.
                                                                                  ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.90 FLOOD WIDTH(FEET) = 67.30
                                                                                   FLOW PROCESS FROM NODE 21635.00 TO NODE 21636.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 5.04 DEPTH*VELOCITY (FT*FT/SEC) = 4.52
 LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21634.00 = 1715.86 FEET.
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                                 ______
 FLOW PROCESS FROM NODE 21634.00 TO NODE 21635.00 IS CODE = 92
                                                                                   UPSTREAM ELEVATION(FEET) = 1060.00 DOWNSTREAM ELEVATION(FEET) = 1057.00
                                                                                   STREET LENGTH (FEET) = 680.40 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM NODE ELEVATION (FEET) = 1061.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1060.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 CHANNEL LENGTH THRU SUBAREA (FEET) = 277.53
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 MAXIMUM DEPTH(FEET) = 1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                  qΑ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
     LAND USE
 RESIDENTIAL
                                                                                     ***STREET FLOWING FULL***
                      В 13.91
                                                       56
 "8-10 DWELLINGS/ACRE"
                                          0.75
                                                  0.400
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MOBILE HOME PARK
                      В 0.62
                                         0.75
                                                 0.250 56
                                                                                    STREET FLOW DEPTH(FEET) = 1.05
 RESIDENTIAL
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 45.42
 ".4 DWELLING/ACRE"
                       B 1.57 0.75
                                                 0.900
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.443
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 3.16 Tc (MIN.) = 29.15
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 112.81
                                                                                   * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.927
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.11
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                          Fρ
 AVERAGE FLOW DEPTH(FEET) = 1.00 FLOOD WIDTH(FEET) = 79.47
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                    αA
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 25.99
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
                                                                                                        B 6.22 0.75 0.250
                                                                                   MOBILE HOME PARK
 SUBAREA AREA(ACRES) = 16.10 SUBAREA RUNOFF(CFS) = 25.12
 EFFECTIVE AREA(ACRES) = 77.96 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                                                                   RESIDENTIAL
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
                                                                                   "8-10 DWELLINGS/ACRE" B 30.75 0.75 0.400
 TOTAL AREA (ACRES) = 78.0 PEAK FLOW RATE (CFS) =
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.375
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   SUBAREA AREA (ACRES) = 36.97 SUBAREA RUNOFF (CFS) = 54.81
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
                                                                                   EFFECTIVE AREA(ACRES) = 114.93 AREA-AVERAGED Fm(INCH/HR) = 0.31
 ** PIPE SIZED TO MAXIMIZE V-GUTTER FLOW AT DOWNSTREAM NODE **
                                                                                   AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.47
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
                                                                                   TOTAL AREA (ACRES) = 114.9 PEAK FLOW RATE (CFS) = 167.43
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 5.50
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PIPE-FLOW(CFS) = 45.70
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 25.71
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.079
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 16.10 SUBAREA RUNOFF (CFS) = 25.32
                                                                                   DEPTH(FEET) = 1.09 HALFSTREET FLOOD WIDTH(FEET) = 47.37
 EFFECTIVE AREA(ACRES) = 77.96 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                                                                   FLOW VELOCITY (FEET/SEC.) = 3.67 DEPTH*VELOCITY (FT*FT/SEC.) = 3.99
```

Date: 04/21/2014 File name: LR0216ZZ.RES Page 27

File name: LR0216ZZ.RES

Page 28

Date: 04/21/2014

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 6.99
 PIPE-FLOW(CFS) = 87.94
 PIPEFLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 27.61
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.991
 SUBAREA AREA (ACRES) = 36.97 SUBAREA RUNOFF (CFS) = 56.93
 TOTAL AREA (ACRES) = 114.9 PEAK FLOW RATE (CFS) = 174.02
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.08
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.38
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.75
 LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21636.00 = 2673.79 FEET.
******************
 FLOW PROCESS FROM NODE 21636.00 TO NODE 21637.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1057.00 DOWNSTREAM ELEVATION(FEET) = 1052.00
 STREET LENGTH (FEET) = 615.48 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 177.52
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.00
   HALFSTREET FLOOD WIDTH (FEET) = 42.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.72
 STREET FLOW TRAVEL TIME (MIN.) = 2.17 Tc (MIN.) = 29.78
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.903
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                              Аp
                                                          SCS
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

```
"8-10 DWELLINGS/ACRE" B 4.85 0.75 0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA (ACRES) = 4.85 SUBAREA RUNOFF (CFS) = 7.00
 EFFECTIVE AREA(ACRES) = 119.78 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.47
 TOTAL AREA(ACRES) = 119.8
                                  PEAK FLOW RATE (CFS) = 174.02
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 42.61
 FLOW VELOCITY(FEET/SEC.) = 4.70 DEPTH*VELOCITY(FT*FT/SEC.) = 4.66
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.09
 PIPE-FLOW(CFS) = 100.50
 PIPEFLOW TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 28.74
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.944
 SUBAREA AREA (ACRES) = 4.85 SUBAREA RUNOFF (CFS) = 7.18
 TOTAL AREA (ACRES) = 119.8 PEAK FLOW RATE (CFS) = 176.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 75.81
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.92
 LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21637.00 = 3289.27 FEET.
*******************
 FLOW PROCESS FROM NODE 21637.00 TO NODE 21649.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1052.00 DOWNSTREAM ELEVATION(FEET) = 1051.00
 STREET LENGTH (FEET) = 2286.91 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                         Page 30
```

RESIDENTIAL

Date: 04/21/2014 File name: LR0216ZZ.RES Page 29 Date: 04/21/2014 File name: LR0216ZZ.RES

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 176.31
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.61
   HALFSTREET FLOOD WIDTH (FEET) = 79.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.42
 STREET FLOW TRAVEL TIME (MIN.) = 25.30 Tc (MIN.) = 54.04
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.331
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 119.78 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 119.8 PEAK FLOW RATE (CFS) = 176.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.61 HALFSTREET FLOOD WIDTH(FEET) = 79.07
 FLOW VELOCITY (FEET/SEC.) = 1.51 DEPTH*VELOCITY (FT*FT/SEC.) = 2.42
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 3.27
 PIPE-FLOW(CFS) = 135.28
 PIPEFLOW TRAVEL TIME (MIN.) = 11.64 Tc (MIN.) = 40.38
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.585
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 TOTAL AREA (ACRES) = 119.8 PEAK FLOW RATE (CFS) = 176.31
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.03
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 41.03
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.01
   HALFSTREET FLOOD WIDTH (FEET) = 48.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.03
 LONGEST FLOWPATH FROM NODE 21630.00 TO NODE 21649.00 = 5576.18 FEET.
******************
 FLOW PROCESS FROM NODE 21649.00 TO NODE 21649.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TOTAL NUMBER OF STREAMS = 3
```

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 40.38
 RAINFALL INTENSITY (INCH/HR) = 1.59
 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp (INCH/HR) = 0.65
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 119.78
 TOTAL STREAM AREA(ACRES) = 119.78
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 176.31
******************
 FLOW PROCESS FROM NODE 21640.00 TO NODE 21641.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 905.18
 ELEVATION DATA: UPSTREAM(FEET) = 1069.00 DOWNSTREAM(FEET) = 1065.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.693
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 3.033
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               qД
                                                       SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                             7.30 0.75 0.100 56 13.69
 COMMERCIAL
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA RUNOFF(CFS) = 19.44
 TOTAL AREA (ACRES) = 7.30 PEAK FLOW RATE (CFS) = 19.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
*********************
 FLOW PROCESS FROM NODE 21641.00 TO NODE 21642.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1065.00 DOWNSTREAM ELEVATION(FEET) = 1061.00
 STREET LENGTH (FEET) = 479.84 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.41
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 22.82
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0216ZZ.RES Page 31

File name: LR0216ZZ.RES Page 32

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.82
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.73
 STREET FLOW TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 16.53
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.709
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                       В
                              9.25 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA (ACRES) = 9.25 SUBAREA RUNOFF (CFS) = 21.93
 EFFECTIVE AREA(ACRES) = 16.55 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 16.5 PEAK FLOW RATE (CFS) = 39.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.16
 FLOW VELOCITY (FEET/SEC.) = 3.01 DEPTH*VELOCITY (FT*FT/SEC.) = 1.99
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21642.00 = 1385.02 FEET.
******************
 FLOW PROCESS FROM NODE 21642.00 TO NODE 21643.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1061.00 DOWNSTREAM ELEVATION(FEET) = 1059.00
 STREET LENGTH (FEET) = 183.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.16
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.27
 STREET FLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 17.42
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.625
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Дp
                                                         SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                                4.86
                                       0.75
                                                0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 4.86 SUBAREA RUNOFF(CFS) = 11.16
```

```
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 21.4 PEAK FLOW RATE (CFS) =
                                                           49.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.68 HALFSTREET FLOOD WIDTH (FEET) = 26.62
 FLOW VELOCITY (FEET/SEC.) = 3.53 DEPTH*VELOCITY (FT*FT/SEC.) = 2.39
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21643.00 = 1568.02 FEET.
******************
 FLOW PROCESS FROM NODE 21643.00 TO NODE 21644.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1059.00 DOWNSTREAM ELEVATION(FEET) = 1057.00
 STREET LENGTH (FEET) = 213.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     55.86
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 31.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
 STREET FLOW TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 18.47
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.535
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                               6.06 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 6.06 SUBAREA RUNOFF(CFS) = 13.42
 EFFECTIVE AREA(ACRES) = 27.47 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 27.5 PEAK FLOW RATE (CFS) = 60.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 32.72
 FLOW VELOCITY (FEET/SEC.) = 3.47 DEPTH*VELOCITY (FT*FT/SEC.) = 2.56
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21644.00 = 1781.52 FEET.
       Date: 04/21/2014
                       File name: LR0216ZZ.RES
```

Page 34

EFFECTIVE AREA(ACRES) = 21.41 AREA-AVERAGED Fm(INCH/HR) = 0.07

Date: 04/21/2014 File name: LR0216ZZ.RES Page 33

```
**********************
 FLOW PROCESS FROM NODE 21644.00 TO NODE 21645.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1057.00 DOWNSTREAM ELEVATION(FEET) = 1055.00
 STREET LENGTH (FEET) = 205.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 34.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.71
 STREET FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 19.42
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.459
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                       SCS
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL B 5.75 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA (ACRES) = 5.75 SUBAREA RUNOFF (CFS) = 12.34
 EFFECTIVE AREA(ACRES) = 33.22 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 33.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 35.84
 FLOW VELOCITY (FEET/SEC.) = 3.62 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21645.00 = 1986.52 FEET.
FLOW PROCESS FROM NODE 21645.00 TO NODE 21646.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1055.00 DOWNSTREAM ELEVATION(FEET) = 1053.00
 STREET LENGTH (FEET) = 420.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     82.80
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 42.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.57
 STREET FLOW TRAVEL TIME (MIN.) = 2.40 Tc (MIN.) = 21.82
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.294
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                       B 11.52 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA (ACRES) = 11.52 SUBAREA RUNOFF (CFS) = 23.00
 EFFECTIVE AREA(ACRES) = 44.74 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 44.7 PEAK FLOW RATE (CFS) = 89.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 43.49
 FLOW VELOCITY (FEET/SEC.) = 3.00 DEPTH*VELOCITY (FT*FT/SEC.) = 2.69
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 420.5 FT WITH ELEVATION-DROP = 2.0 FT, IS 37.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21646.00
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21646.00 = 2407.02 FEET.
******************
 FLOW PROCESS FROM NODE 21646.00 TO NODE 21647.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1053.00 DOWNSTREAM ELEVATION(FEET) = 1052.00
 STREET LENGTH (FEET) = 290.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

File name: LR0216ZZ.RES

Page 36

Date: 04/21/2014

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00

Date: 04/21/2014 File name: LR0216ZZ.RES Page 35

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 97.08
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.96
   HALFSTREET FLOOD WIDTH (FEET) = 46.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.63
 STREET FLOW TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 23.58
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.189
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       rp Ap
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                               8.13 0.75 0.100 56
 COMMERCIAL
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 8.13 SUBAREA RUNOFF(CFS) = 15.47
 EFFECTIVE AREA(ACRES) = 52.87 AREA-AVERAGED Fm(INCH/HR) = 0.07
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.10
 TOTAL AREA (ACRES) = 52.9 PEAK FLOW RATE (CFS) = 100.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.97 HALFSTREET FLOOD WIDTH(FEET) = 47.09
 FLOW VELOCITY (FEET/SEC.) = 2.77 DEPTH*VELOCITY (FT*FT/SEC.) = 2.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 290.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 27.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21647.00
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21647.00 = 2697.02 FEET.
*************************
 FLOW PROCESS FROM NODE 21647.00 TO NODE 21648.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1052.00 DOWNSTREAM ELEVATION(FEET) = 1051.00
 STREET LENGTH (FEET) = 382.94 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 112.10
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.04
```

```
HALFSTREET FLOOD WIDTH (FEET) = 44.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.84
 STREET FLOW TRAVEL TIME (MIN.) = 2.33 Tc (MIN.) = 25.91
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.069
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                      В 11.59 0.75
                                                 0.100
 RESIDENTIAL
                      B 1.73 0.75 0.900
 ".4 DWELLING/ACRE"
                                                         56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.204
 SUBAREA AREA (ACRES) = 13.32 SUBAREA RUNOFF (CFS) = 22.97
 EFFECTIVE AREA(ACRES) = 66.19 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.12
 TOTAL AREA (ACRES) = 66.2 PEAK FLOW RATE (CFS) = 117.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.05 HALFSTREET FLOOD WIDTH(FEET) = 45.72
 FLOW VELOCITY (FEET/SEC.) = 2.77 DEPTH*VELOCITY (FT*FT/SEC.) = 2.92
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 4.92
 PIPE-FLOW(CFS) = 47.40
 PIPEFLOW TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 24.88
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 2.120
 SUBAREA AREA (ACRES) = 13.32 SUBAREA RUNOFF (CFS) = 23.59
 TOTAL AREA(ACRES) = 66.2
                                PEAK FLOW RATE (CFS) = 120.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 73.50
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 37.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.49
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.24
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21648.00 = 3079.96 FEET.
******************
 FLOW PROCESS FROM NODE 21648.00 TO NODE 21649.00 IS CODE = 31
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
ELEVATION DATA: UPSTREAM(FEET) = 1051.50 DOWNSTREAM(FEET) = 1051.00
 FLOW LENGTH (FEET) = 173.09 MANNING'S N = 0.013
```

Date: 04/21/2014 File name: LR0216ZZ.RES Page 37

File name: LR0216ZZ.RES

Page 38

Date: 04/21/2014

```
DEPTH OF FLOW IN 60.0 INCH PIPE IS 46.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 7.47
 ESTIMATED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 120.90
 PIPE TRAVEL TIME (MIN.) = 0.39 Tc (MIN.) = 25.26
 LONGEST FLOWPATH FROM NODE 21640.00 TO NODE 21649.00 = 3253.05 FEET.
******************
 FLOW PROCESS FROM NODE 21649.00 TO NODE 21649.00 IS CODE = 1
.....
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES << < <
______
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.26
 RAINFALL INTENSITY (INCH/HR) = 2.10
 AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.12
 EFFECTIVE STREAM AREA(ACRES) = 66.19
 TOTAL STREAM AREA(ACRES) = 66.19
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                120.90
 ** CONFLUENCE DATA **
 STREAM O TC AREA
                                 HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
         7852.50 63.85 15593.28 20120.00
   1
         176.31 40.38 119.78 21630.00
   3
          120.90 25.26 66.19 21640.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.60;24H= 5.68
 S-GRAPH: VALLEY(DEV.) = 79.3%; VALLEY(UNDEV.) / DESERT = 20.7%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.06; LAG(HR) = 0.85; Fm(INCH/HR) = 0.44; Ybar = 0.47
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61;
 3HR = 0.91; 6HR = 0.96; 24HR = 0.97
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 15779.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21649.00 = 63482.38 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0226; Lca/L=0.4,n=.0202; Lca/L=0.5,n=.0186; Lca/L=0.6,n=.0174
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 3977.55
 PEAK FLOW RATE(CFS) = 7772.19
   (UPSTREAM NODE PEAK FLOW RATE (CFS) = 7852.50)
 PEAK FLOW RATE (CFS) USED = 7852.50
FLOW PROCESS FROM NODE 21649.00 TO NODE 21650.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1051.00 DOWNSTREAM(FEET) = 1040.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1609.00 CHANNEL SLOPE = 0.0068
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
```

```
CHANNEL FLOW THRU SUBAREA(CFS) = 7852.50
 FLOW VELOCITY (FEET/SEC.) = 25.05 FLOW DEPTH (FEET) = 8.17
 TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 64.92
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21650.00 = 65091.38 FEET.
FLOW PROCESS FROM NODE 21650.00 TO NODE 21650.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 64.92
 * 100 YEAR RAINFALL INTENSITY (INCH/HR) = 1.192
 SUBAREA LOSS RATE DATA (AMC II):
                                   Fр
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                             αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    B 55.41 0.75
                                             0.900
                                                    56
                     B 8.21 0.75 0.100
                                                    56
 COMMERCIAL
 RESIDENTIAL
                    B 0.13
B 0.17
 "8-10 DWELLINGS/ACRE"
                                     0.75 0.400
                                     0.75 0.600
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.795
 SUBAREA AREA (ACRES) = 63.92
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.59;24H= 5.68
 S-GRAPH: VALLEY(DEV.) = 79.0%; VALLEY(UNDEV.)/DESERT= 21.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.08; LAG(HR) = 0.87; Fm(INCH/HR) = 0.45; Ybar = 0.47
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61;
 3HR = 0.91; 6HR = 0.96; 24HR = 0.97
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 15843.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21650.00 = 65091.38 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0224; Lca/L=0.4,n=.0201; Lca/L=0.5,n=.0185; Lca/L=0.6,n=.0172
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 3985.32
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7778.47
 TOTAL AREA(ACRES) = 15843.2
                               PEAK FLOW RATE (CFS) = 7852.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
******************
 FLOW PROCESS FROM NODE 21650.00 TO NODE 21651.00 IS CODE = 54
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1040.00 DOWNSTREAM(FEET) = 1020.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1766.25 CHANNEL SLOPE = 0.0113
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 7852.50
 FLOW VELOCITY (FEET/SEC.) = 30.10 FLOW DEPTH (FEET) = 7.18
 TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 65.90
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21651.00 = 66857.62 FEET.
```

Date: 04/21/2014 File name: LR0216ZZ.RES

Page 40

Date: 04/21/2014 File name: LR0216ZZ.RES Page 39

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21651.00 TO NODE 21651.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 65.90\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.182 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL В 17.50 0.75 0.100 56 NATURAL FAIR COVER "OPEN BRUSH" В 8.34 0.61 1.000 66 RESIDENTIAL ".4 DWELLING/ACRE" В 56.16 0.75 0.900 56 SCHOOL В 0.36 56 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.739 SUBAREA AREA(ACRES) = 82.36 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.19;3H= 1.92;6H= 2.59;24H= 5.67 S-GRAPH: VALLEY (DEV.) = 78.7%; VALLEY (UNDEV.) / DESERT = 21.3% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 1.10; LAG(HR) = 0.88; Fm(INCH/HR) = 0.45; Ybar = 0.47USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61; 3HR = 0.91; 6HR = 0.96; 24HR = 0.97UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 15925.5 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21651.00 = 66857.62 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0222; Lca/L=0.4,n=.0199; Lca/L=0.5,n=.0183; Lca/L=0.6,n=.0171 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 3997.35 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 7752.13 TOTAL AREA(ACRES) = 15925.5 PEAK FLOW RATE (CFS) = 7852.50NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75 \_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 15925.5 TC(MIN.) =65.90

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\_\_\_\_\_\_

AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.47

PEAK FLOW RATE (CFS) = 7852.50

Date: 04/21/2014 File name: LR0216ZZ.RES Page 41 Date: 04/21/2014 File name: LR0216ZZ.RES Page 42

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 20151

1.50 0.0312 0.125 0.0180

Page 1

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0201ZZ.DAT

16 12.5

5.0

Date: 04/21/2014

TIME/DATE OF STUDY: 15:09 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.0300

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 0.67 2.00 0.0312 0.167 0.0180 20.0 0.020/0.020/0.020 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

0.020/0.020/0.020 0.50

File name: LR020177.RFS

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20100.00 TO NODE 20101.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 219.52 ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2385.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.474 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.918 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE NATURAL FAIR COVER "OPEN BRUSH" 1.33 0.61 1.000 66 10.43 NATURAL FAIR COVER "OPEN BRUSH" 0.04 0.86 1.000 46 10.43 RESIDENTIAL 2.55 0.700 "2 DWELLINGS/ACRE" R 0.75 56 6.47 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.805 SUBAREA RUNOFF(CFS) = 11.85 TOTAL AREA (ACRES) = 3.92 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12 FLOW PROCESS FROM NODE 20101.00 TO NODE 20102.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 2385.00 DOWNSTREAM ELEVATION(FEET) = 2340.00 File name: LR020177.RFS

Page 2

Date: 04/21/2014

```
STREET LENGTH (FEET) = 138.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREET FLOW DEPTH (FEET) = 0.44
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 15.77
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.45
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.43
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.84
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 7.45
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.25
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.601
   STREET FLOW DEPTH (FEET) = 0.30
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 8.90
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.03
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.05
                                                                                 NATURAL FAIR COVER
 STREET FLOW TRAVEL TIME (MIN.) = 0.23 Tc(MIN.) = 6.70
                                                                                 "OPEN BRUSH"
                                                                                                      A 1.17
                                                                                                                        0.86
                                                                                                                               1.000
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.836
                                                                                 NATURAL FAIR COVER
                                                                                                     В 2.63
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 "OPEN BRUSH"
                                                                                                                        0.61 1.000
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                 RESIDENTIAL
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 "2 DWELLINGS/ACRE" B 3.01
                                                                                                                        0.75 0.700
 NATURAL FAIR COVER
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
                      A 0.45
 "OPEN BRUSH"
                                        0.86
                                               1.000 46
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
                                                                                 SUBAREA AREA (ACRES) = 6.81 SUBAREA RUNOFF (CFS) = 18.30
 NATURAL FAIR COVER
                      В 0.90
 "OPEN BRUSH"
                                        0.61
                                                1.000
                                                      66
                                                                                 EFFECTIVE AREA(ACRES) = 15.09 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.83
 RESIDENTIAL
                      B 3.01 0.75 0.700 56
                                                                                 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.793
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 4.36 SUBAREA RUNOFF (CFS) = 12.79
                                                                                 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
 EFFECTIVE AREA(ACRES) = 8.28 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.80
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 8.3 PEAK FLOW RATE (CFS) = 24.36
                                                                                 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.10
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.72 DEPTH*VELOCITY (FT*FT/SEC.) = 3.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20103.00 = 645.52 FEET.
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
                                                                               ********************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 FLOW PROCESS FROM NODE 20103.00 TO NODE 20104.00 IS CODE = 63
                                                                               ______
 DEPTH(FEET) = 0.33 HALFSTREET FLOOD WIDTH(FEET) = 10.07
 FLOW VELOCITY (FEET/SEC.) = 10.76 DEPTH*VELOCITY (FT*FT/SEC.) = 3.52
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20102.00 = 358.25 FEET.
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               ______
*******************
                                                                                 UPSTREAM ELEVATION(FEET) = 2320.00 DOWNSTREAM ELEVATION(FEET) = 2310.00
 FLOW PROCESS FROM NODE 20102.00 TO NODE 20103.00 IS CODE = 63
                                                                                 STREET LENGTH (FEET) = 249.70 CURB HEIGHT (INCHES) = 6.0
______
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                                 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2340.00 DOWNSTREAM ELEVATION(FEET) = 2320.00
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 287.27 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
```

Page 3

Date: 04/21/2014 File name: LR0201ZZ.RES

Date: 04/21/2014 File name: LR0201ZZ.RES Page 4

33.51

46

66

40.90

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 172.75
   ***STREET FLOWING FULL***
                                                                                        ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.59
                                                                                       STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 22.71
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 29.30
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.94
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.12
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.00
 STREET FLOW TRAVEL TIME (MIN.) = 0.60 Tc (MIN.) = 8.05
                                                                                      STREET FLOW TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 9.34
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.438
                                                                                      * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.144
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                      SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
                                                                                                                                               SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                          LAND USE
                                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                                      NATURAL FAIR COVER
 "OPEN BRUSH"
                       A
                               1.82
                                           0.86
                                                   1.000
                                                         46
                                                                                      "OPEN BRUSH"
                                                                                                            A 5.68
                                                                                                                                0.86
                                                                                                                                        1.000
                                                                                                                                                46
 NATURAL FAIR COVER
                                                                                      RESIDENTIAL
 "OPEN BRUSH"
                        В 19.46
                                           0.61
                                                   1.000
                                                                                      "2 DWELLINGS/ACRE"
                                                                                                            A 3.92
                                                                                                                               0.98
                                                                                                                                        0.700
                                                                                                                                                32
                                                          66
 RESIDENTIAL
                                                                                      RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В 6.79
                                           0.75
                                                   0.700
                                                                                      "2 DWELLINGS/ACRE"
                                                                                                                      6.10
                                                                                                                               0.75
                                                                                                                                        0.700
                                                                                                                                                56
 RESIDENTIAL
                                                                                      NATURAL FAIR COVER
 "2 DWELLINGS/ACRE"
                                 0.01
                                           0.98
                                                 0.700 32
                                                                                      "OPEN BRUSH"
                                                                                                              В
                                                                                                                      39.60
                                                                                                                               0.61
                                                                                                                                     1.000
                       A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927
                                                                                      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946
 SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 71.52
                                                                                      SUBAREA AREA(ACRES) = 55.30 SUBAREA RUNOFF(CFS) = 124.93
 EFFECTIVE AREA(ACRES) = 43.17 AREA-AVERAGED Fm(INCH/HR) = 0.60
                                                                                      EFFECTIVE AREA(ACRES) = 98.47 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89
                                                                                      AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.92
 TOTAL AREA (ACRES) = 43.2 PEAK FLOW RATE (CFS) = 110.20
                                                                                      TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) =
                                                                                                                                                223.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
                                                                                      5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.01
                                                                                      DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.42
 FLOW VELOCITY (FEET/SEC.) = 7.73 DEPTH*VELOCITY (FT*FT/SEC.) = 5.10
                                                                                      FLOW VELOCITY (FEET/SEC.) = 10.29 DEPTH*VELOCITY (FT*FT/SEC.) = 8.11
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 249.7 FT WITH ELEVATION-DROP = 10.0 FT, IS 74.7 CFS,
                                                                                      *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20104.00
                                                                                            THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20104.00 = 895.22 FEET.
                                                                                      SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                      ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
*********************
                                                                                      ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 FLOW PROCESS FROM NODE 20104.00 TO NODE 20105.00 IS CODE = 63
                                                                                      DEPTH OF FLOW IN 33.0 INCH PIPE IS 26.4 INCHES
                                                                                      PIPE-FLOW VELOCITY(FEET/SEC.) = 21.64
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                      PIPE-FLOW(CFS) = 110.20
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 8.62
______
                                                                                      * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.298
 UPSTREAM ELEVATION(FEET) = 2310.00 DOWNSTREAM ELEVATION(FEET) = 2270.00
                                                                                      SUBAREA AREA(ACRES) = 55.30 SUBAREA RUNOFF(CFS) = 132.60
 STREET LENGTH (FEET) = 747.57 CURB HEIGHT (INCHES) = 6.0
                                                                                      TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) = 237.37
 STREET HALFWIDTH (FEET) = 18.00
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                      5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                      STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 127.17
                                                                                       ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                       STREET FLOW DEPTH(FEET) = 0.66
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 26.01
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.92
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.69
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.89
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 5 Date: 04/21/2014 File name: LR0201ZZ.RES Page 6

```
LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20105.00 = 1642.79 FEET.
                                                                         LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20107.00 = 4211.69 FEET.
********************
                                                                       *******************
 FLOW PROCESS FROM NODE 20105.00 TO NODE 20106.00 IS CODE = 54
                                                                         FLOW PROCESS FROM NODE 20107.00 TO NODE 20107.00 IS CODE = 81
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
                                                                         MAINLINE Tc (MIN.) = 12.72
 ELEVATION DATA: UPSTREAM(FEET) = 2270.00 DOWNSTREAM(FEET) = 2230.00
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.612
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1238.14 CHANNEL SLOPE = 0.0323
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         DEVELOPMENT TYPE/
                                                                                          SCS SOIL AREA
                                                                                                         Fp
                                                                                                               Ap
                                                                                                                         SCS
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.30
                                                                            LAND USE
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            237.37
                                                                         NATURAL FAIR COVER
 FLOW VELOCITY (FEET/SEC.) = 10.01 FLOW DEPTH (FEET) = 2.41
                                                                         "OPEN BRUSH"
                                                                                                2.55
                                                                                                            0.86
                                                                                                                   1.000
                                                                                                                          46
 TRAVEL TIME (MIN.) = 2.06 Tc (MIN.) = 10.69
                                                                         RESIDENTIAL
                                                                                            A 12.67
                                                                                                            0.98
                                                                                                                   0.700
                                                                                                                          32
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20106.00 = 2880.93 FEET.
                                                                         "2 DWELLINGS/ACRE"
                                                                         RESIDENTIAL
"2 DWELLINGS/ACRE"
                                                                                                   10.30
                                                                                                            0.75
                                                                                                                   0.700
                                                                                                                          56
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20106.00 IS CODE = 81
                                                                         NATURAL FAIR COVER
                                                                         "OPEN BRUSH"
______
                                                                                                    66.90
                                                                                                            0.61 1.000
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.925
 MAINLINE Tc(MIN.) = 10.69
                                                                         SUBAREA AREA(ACRES) = 92.42
                                                                                                    SUBAREA RUNOFF (CFS) = 165.69
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.900
                                                                         EFFECTIVE AREA(ACRES) = 349.72 AREA-AVERAGED Fm(INCH/HR) = 0.61
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.93
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fp
                                            Aр
                                                  SCS
                                                                         TOTAL AREA (ACRES) = 349.7 PEAK FLOW RATE (CFS) = 628.60
     LAND HSE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                           1.000
 "OPEN BRUSH"
                    A
                           2.42
                                                                         5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
                                    0.86
                                                 46
 RESIDENTIAL
                                                                       ******************
                            7.44
 "2 DWELLINGS/ACRE"
                                    0.98
                                           0.700
                                                  32
 RESIDENTIAL
                                                                         FLOW PROCESS FROM NODE 20107.00 TO NODE 20108.00 IS CODE = 54
 "2 DWELLINGS/ACRE"
                            21.25
                                    0.75
                                           0.700
                                                                       ______
 NATURAL FAIR COVER
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "OPEN BRUSH"
                         127.72
                                    0.61 1.000
                      В
                                                                        >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
                                                                       _____
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2095.00
 SUBAREA AREA(ACRES) = 158.83 SUBAREA RUNOFF(CFS) = 327.54
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 1995.70 CHANNEL SLOPE = 0.0376
 EFFECTIVE AREA(ACRES) = 257.30 AREA-AVERAGED Fm(INCH/HR) = 0.61
                                                                         CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.94
                                                                         MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
 TOTAL AREA (ACRES) = 257.3 PEAK FLOW RATE (CFS) = 529.63
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) = 628.60
                                                                         FLOW VELOCITY (FEET/SEC.) = 10.92 FLOW DEPTH (FEET) = 1.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         TRAVEL TIME (MIN.) = 3.05 Tc (MIN.) = 15.77
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
                                                                         LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20108.00 = 6207.39 FEET.
*********************
                                                                       *******************
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20107.00 IS CODE = 54
                                                                         FLOW PROCESS FROM NODE 20108.00 TO NODE 20108.00 IS CODE = 81
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                       _____
                                                                         MAINLINE Tc(MIN.) = 15.77
______
 ELEVATION DATA: UPSTREAM(FEET) = 2230.00 DOWNSTREAM(FEET) = 2170.00
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.296
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1330.76 CHANNEL SLOPE = 0.0451
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
                                                                                                                  Аp
                                                                         DEVELOPMENT TYPE/
                                                                                           SCS SOIL AREA
                                                                                                         Fр
                                                                                                                         SCS
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            529.63
                                                                         NATURAL FAIR COVER
 FLOW VELOCITY (FEET/SEC.) = 10.89 FLOW DEPTH (FEET) = 1.48
                                                                         "OPEN BRUSH"
                                                                                            A
                                                                                                  3.92 0.86
                                                                                                                  1.000
                                                                                                                         46
 TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 12.72
                                                                         RESIDENTIAL
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 7

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 8

"2 DWELLINGS/ACRE"	A	0.86	0.98	0.700	32	 TOTAL AREA(ACRES) =
RESIDENTIAL						
"3-4 DWELLINGS/ACRE" MOBILE HOME PARK	A	16.85	0.98	0.600		 SUBAREA AREA-AVERAGEI
MOBILE HOME PARK	В	25.39	0.75	0.250	56	 5M = 0.38; 30M = 0.78
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	В	10.75	0.75	0.600	56	 ************
NATURAL FAIR COVER						 FLOW PROCESS FROM NOI
'OPEN BRUSH"	В	87.64	0.61	1.000	66	 
SUBAREA AVERAGE PERVIO	US LOSS RA	ATE, Fp(INC	H/HR) = 0	.67		 >>>>PEAK FLOW RATE H
SUBAREA AVERAGE PERVIO						 >>>>USING TIME-OF-CO
SUBAREA AREA(ACRES) =	145.41	SUBAREA	RUNOFF (CF	S) = 231.	05	 =======================================
EFFECTIVE AREA(ACRES)					= 0.59	 UNIT-HYDROGRAPH DATA:
AREA-AVERAGED Fp(INCH/	HR) = 0.6	66 AREA-AVE	ERAGED Ap	= 0.89		 RAINFALL(INCH): 5M= (
TOTAL AREA (ACRES) =	495.1	PEAK E	FLOW RATE (	CFS) =	760.30	 S-GRAPH: VALLEY (DEV.)
						 MOUNTAIN= (
SUBAREA AREA-AVERAGED	RAINFALL I	DEPTH (INCH):	:			 Tc(HR) = 0.32; LAG(HR)
5M = 0.38; 30M = 0.78;	1HR = 1.0	03; 3HR = 1.	.91; 6HR =	2.83; 24H	IR = 6.12	 USED SIERRA MADRE DER
						 DEPTH-AREA FACTORS: 5
******	******	*********	******	*****	*****	 3HR = 1.00; 6HR = 1.00
FLOW PROCESS FROM NODE	20108.00	TO NODE 2	20109.00 I	S CODE =	54	 UNIT-INTERVAL (MIN) =
						LONGEST FLOWPATH FROM
>>>>COMPUTE TRAPEZOID	AL CHANNEI	L FLOW<				EQUIVALENT BASIN FAC
>>>>TRAVELTIME THRU S	UBAREA (EX	KISTING ELEM	MENT) <<<<			Lca/L=0.3,n=.0337; I
						TIME OF PEAK FLOW(HR)
ELEVATION DATA: UPSTRE	AM(FEET) =	= 2095.00	DOWNSTRE.	AM(FEET) =	2020.00	 UNIT-HYDROGRAPH METHO
CHANNEL LENGTH THRU SU	BAREA (FEET	$\Gamma$ ) = 2023.9	91 CHANN	EL SLOPE =	0.0371	 TOTAL PEAK FLOW RATE
CHANNEL BASE (FEET) =	40.00 "	'Z" FACTOR =	= 2.000			 RATIONAL METHOD PEAK
MANNING'S FACTOR = 0.0	35 MAXIN	4UM DEPTH(FE	EET) = 10	.00		 (UPSTREAM NODE PEAK
				.00		(UPSTREAM NODE PEAK PEAK FLOW RATE(CFS) U
CHANNEL FLOW THRU SUBA	REA(CFS) =	760.30	)			(UPSTREAM NODE PEAK PEAK FLOW RATE(CFS) U
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC	REA(CFS) = .) = 10.6	= 760.30 59 FLOW DE	) EPTH (FEET)			
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) =	REA(CFS) = .) = 10.6 3.16 Tc(	= 760.30 59 FLOW DE (MIN.) = 1	DEPTH (FEET) 18.92	= 1.64	231.30 FEET.	PEAK FLOW RATE(CFS) U
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) =	REA(CFS) = .) = 10.6 3.16 Tc(	= 760.30 59 FLOW DE (MIN.) = 1	DEPTH (FEET) 18.92	= 1.64	231.30 FEET.	PEAK FLOW RATE(CFS) T
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM	REA(CFS) = .) = 10.6 3.16 Tc: NODE 2010	= 760.30 59 FLOW DE (MIN.) = 1	DEPTH(FEET) 18.92 DE 20109.	= 1.64 00 = 82		PEAK FLOW RATE(CFS) U ************************************
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ***********************************	REA(CFS) = 10.6 3.16 Tc 0 NODE 2010 ***********	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOI	DEPTH (FEET) 18.92 DE 20109.	= 1.64 00 = 82 ************* S CODE =	*******	PEAK FLOW RATE (CFS) U  ************  FLOW PROCESS FROM NOI
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ************************************	REA(CFS) = 10.6 3.16 Tc 0 NODE 2010 ************ 20109.00	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NOD ************************************	DEPTH (FEET) 18.92 DE 20109.	= 1.64 00 = 82 ************* S CODE =	*******	PEAK FLOW RATE (CFS) U  **************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR	REA(CFS) = 10.6 3.16 Tc: NODE 2010 ******* 20109.00 EA TO MAIN	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD ************** 0 TO NODE 2	DEPTH (FEET) 18.92 DE 20109. ******** 20109.00 I	= 1.64 00 = 82 ******** S CODE =	81	PEAK FLOW RATE (CFS) U  *****************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR	REA(CFS) = 10.6 3.16 TC 0 NODE 2010 ********** 20109.00 EA TO MAIN	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD ************** 0 TO NODE 2	DEPTH (FEET) 18.92 DE 20109. ******** 20109.00 I	= 1.64 00 = 82 ******** S CODE =	81	PEAK FLOW RATE (CFS) U  ****************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ****************** FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) =	REA(CFS) = 10.6 3.16 TC 0 NODE 2010 ********* 20109.00 EA TO MAIN ====================================	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD ************* 0 TO NODE 2	DEPTH(FEET) 18.92 DE 20109. ******** 20109.00 I	= 1.64 00 = 82 ******** S CODE =	81	PEAK FLOW RATE (CFS) U  ******************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ********************* FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR  ===================================	REA(CFS) = 10.6 3.16 TC   NODE 2010  ********* 20109.00  EA TO MAIN ====================================	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD ************ 0 TO NODE 2	DEPTH(FEET) 18.92 DE 20109. ******** 20109.00 I	= 1.64 00 = 82 ******** S CODE =	81	PEAK FLOW RATE (CFS) U  *****************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010 ********** 20109.00 EA TO MAIN	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  ) TO NODE 2  NLINE PEAK E	DEPTH(FEET) 18.92 DE 20109. ************************************	= 1.64 00 = 82 ********* S CODE =	81	PEAK FLOW RATE (CFS) U  *************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ELEVATION DATA: UPSTE  CHANNEL LENGTH THRU S  CHANNEL BASE (FEET) =  MANNING'S FACTOR = 0  CHANNEL FLOW THRU SUE
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  O TO NODE 2  NLINE PEAK E  NCH/HR) = 2  L AREA	DEPTH(FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 ******** S CODE = 	81 	PEAK FLOW RATE (CFS) U  ***************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC FRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010  ********** 20109.00	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  ) TO NODE 2  NLINE PEAK E	DEPTH(FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 ******** S CODE = 	81 	PEAK FLOW RATE (CFS) U  ***************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC FRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ********************* FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc: NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  ) TO NODE 2  NLINE PEAK E	DEPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 ********* S CODE = 	**************************************	PEAK FLOW RATE (CFS) U  **************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************  FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc: NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  O TO NODE 2  NLINE PEAK E  NCH/HR) = 2  L AREA	DEPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 ********* S CODE = 	**************************************	PEAK FLOW RATE (CFS) U  **************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ****************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   3.16 Tc   NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  ) TO NODE 2  NLINE PEAK F	EPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ********************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc: NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ***********  ) TO NODE 2  NLINE PEAK E	DEPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 ********* S CODE = 	**************************************	PEAK FLOW RATE (CFS) U  *******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	REA(CFS) = .) = 10.6 3.16 Tc   NODE 2010  ********* 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  **************  O TO NODE 2	EPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<< 2.058  Fp (INCH/HR)  0.86  0.98	= 1.64 00 = 82 ************* S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI >>>>>TRAVELTIME THRU  ELEVATION DATA: UPSTF CHANNEL LENGTH THRU S CHANNEL BASE (FEET) = MANNING'S FACTOR = 0 CHANNEL FLOW THRU SU FLOW VELOCITY (FEET/SF TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  *******************************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC FRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ********************** FLOW PROCESS FROM NODE	REA(CFS) = .) = 10.6 3.16 Tc   NODE 2010  ********* 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  **************  O TO NODE 2	EPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<<	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ELEVATION DATA: UPSTE CHANNEL LENGTH THRU S CHANNEL BASE (FEET) = MANNING'S FACTOR = 0 CHANNEL FLOW THRU SUF FLOW VELOCITY (FEET/SF TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  *************************  FLOW PROCESS FROM NOI  ->>>>ADDITION OF SUBA
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010 ********** 20109.00	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NODE ************* 0 TO NODE 2	EPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058  Fp (INCH/HR)  0.86  0.98  0.75	= 1.64 00 = 82 ************************************	**************************************	PEAK FLOW RATE (CFS) U  ****************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010 ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  **************  O TO NODE 2	EPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058  Fp (INCH/HR)  0.86  0.98  0.75	= 1.64 00 = 82 ************* S CODE =	**************************************	PEAK FLOW RATE (CFS) U  *****************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ELEVATION DATA: UPSTE CHANNEL LENGTH THRU S CHANNEL BASE (FEET) = MANNING'S FACTOR = 0. CHANNEL FLOW THRU SUE FLOW VELOCITY (FEET/SE TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************************
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************  FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010 ********** 20109.00	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NOD  ************  O TO NODE 2	DEPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<< 2.058 Fp (INCH/HR) 0.86 0.75 0.75	= 1.64 00 = 82 ************************************	**************************************	PEAK FLOW RATE (CFS) U  ****************  FLOW PROCESS FROM NOI
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ********************  FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   NODE 2010 ********** 20109.00	= 760.30 69 FLOW DE (MIN.) = 1 00.00 TO NODE ************* 0 TO NODE 2	DEPTH (FEET) 18.92 DE 20109. ********* 20109.00 I FLOW<<<< 2.058 Fp (INCH/HR) 0.86 0.75 0.75	= 1.64 00 = 82 ************************************	**************************************	PEAK FLOW RATE (CFS) U  *****************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ELEVATION DATA: UPSTE CHANNEL LENGTH THRU S CHANNEL BASE (FEET) = MANNING'S FACTOR = 0. CHANNEL FLOW THRU SUE FLOW VELOCITY (FEET/SE TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************************
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  **********************  FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16    Tc	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************  O TO NODE 2	DEPTH (FEET) L8.92 DE 20109.  ******** 20109.00 I FLOW<<<< 2.058 Fp (INCH/HR) 0.86 0.75 0.75 0.61	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  *****************  FLOW PROCESS FROM NOI  >>>>COMPUTE TRAPEZOI  >>>>TRAVELTIME THRU  ELEVATION DATA: UPSTE CHANNEL LENGTH THRU S CHANNEL BASE (FEET) = MANNING'S FACTOR = 0 CHANNEL FLOW THRU SUE FLOW VELOCITY (FEET/SE TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***********************************
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ********************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   3.16 Tc   NODE 2010  *********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************  O TO NODE 2  NLINE PEAK E  NCH/HR) = 2  :     AREA     (ACRES)	DEPTH (FEET) L8.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058 Fp (INCH/HR) 0.86 0.75 0.75 0.61 H/HR) = 0	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  *******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************** ************* ****	REA(CFS) = 10.6 3.16    Tc    Tc	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************ 0 TO NODE 2  NLINE PEAK E  NCH/HR) = 2  L AREA (ACRES)  2.81  27.06  26.94  35.77  102.40  ATE, FP(INCERACTION, AP	DEPTH (FEET) L8.92 DE 20109.  ********* 20109.00 I	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  *******************  FLOW PROCESS FROM NOI  >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ***************** FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   3.16 Tc   NODE 2010  ********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************ 0 TO NODE 2  NLINE PEAK E  EL AREA (ACRES) 2.81 27.06 26.94 35.77 102.40 ATE, FP(INCERACTION, AP SUBAREA	DEPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058 FP (INCH/HR) 0.86 0.75 0.75 0.75 0.61 H/HR) = 0 -834 RUNOFF (CF	= 1.64 00 = 82 *********** S CODE =	**************************************	PEAK FLOW RATE (CFS) U  *******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC PRAVEL TIME (MIN.) =  LONGEST FLOWPATH FROM  ********************  FLOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   3.16 Tc   NODE 2010  *********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************ 0 TO NODE 2 NLINE PEAK E NCH/HR) = 2 : 2 AREA (ACRES)  2.81  27.06  26.94  35.77  102.40  ATE, Fp(INCH RACTION, Ap SUBAREA  11 AREA-AN	DEPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058  Fp (INCH/HR)  0.86  0.75  0.75  0.61 H/HR) = 0 -834 RUNOFF (CF /ERAGED FM	= 1.64 00 = 82 ************* S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ******************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI  >>>>>TRAVELTIME THRU  ===================================
HANNEL FLOW THRU SUBA LOW VELOCITY (FEET/SEC RAVEL TIME (MIN.) = ONGEST FLOWPATH FROM  ******************* LOW PROCESS FROM NODE	REA(CFS) = 10.6 3.16 Tc   3.16 Tc   NODE 2010  *********** 20109.00	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************ 0 TO NODE 2 NLINE PEAK E NCH/HR) = 2 : 2 AREA (ACRES)  2.81  27.06  26.94  35.77  102.40  ATE, Fp(INCH RACTION, Ap SUBAREA  11 AREA-AN	DEPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I FLOW<<<<< 2.058  Fp (INCH/HR)  0.86  0.75  0.75  0.61 H/HR) = 0 -834 RUNOFF (CF /ERAGED FM	= 1.64 00 = 82 ************* S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ********************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI >>>>>TRAVELTIME THRU  ===================================
CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC CRAVEL TIME (MIN.) =  LONGEST FLOWPATH FROM  *******************  **************	REA(CFS) = 10.6 3.16    Tc    Tc	= 760.30 59 FLOW DE (MIN.) = 1 00.00 TO NOD  ************ 0 TO NODE 2 NLINE PEAK E NCH/HR) = 2 : 2 AREA (ACRES)  2.81  27.06  26.94  35.77  102.40  ATE, Fp(INCH RACTION, Ap SUBAREA  11 AREA-AN	DEPTH (FEET) 18.92 DE 20109.  ********* 20109.00 I	= 1.64 00 = 82 ************* S CODE =	**************************************	PEAK FLOW RATE (CFS) U  ********************  FLOW PROCESS FROM NOI  >>>>>COMPUTE TRAPEZOI >>>>>TRAVELTIME THRU  ===================================

```
= 690.1
             PEAK FLOW RATE (CFS) = 914.67
GED RAINFALL DEPTH(INCH):
.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*************
NODE 20109.00 TO NODE 20109.00 IS CODE = 71
-----
 ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD <<< <
-CONCENTRATION OF LONGEST FLOWPATH
0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
7.) = 32.0%; VALLEY (UNDEV.) / DESERT = 68.0%
 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
(HR) = 0.25; Fm(INCH/HR) = 0.59; Ybar = 0.57
DEPTH-AREA CURVES WITH AMC II CONDITION.
 5M = 0.97; 30M = 0.97; 1HR = 0.97;
1.00; 24HR= 1.00
= 2.50 TOTAL AREA(ACRES) =
ROM NODE 20100.00 TO NODE 20109.00 = 8231.30 FEET.
FACTOR APPROXIMATIONS:
 Lca/L=0.4, n=.0302; Lca/L=0.5, n=.0277; Lca/L=0.6, n=.0259
HR) = 16.25 RUNOFF VOLUME (AF) = 165.31
THOD PEAK FLOW RATE (CFS) = 868.00
TE(CFS) = 868.00 (SOURCE FLOW INCLUDED)
AK FLOW RATE (CFS) = 914.67
AK FLOW RATE(CFS) = 914.67
USED = 914.67
*************
NODE 20109.00 TO NODE 20110.00 IS CODE = 54
._____
ZOIDAL CHANNEL FLOW<
RU SUBAREA (EXISTING ELEMENT) <
_____
STREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 1960.00
 SUBAREA (FEET) = 1927.24 CHANNEL SLOPE = 0.0311
= 10.00 "Z" FACTOR = 2.000
0.015 MAXIMUM DEPTH (FEET) = 5.00
SUBAREA(CFS) = 914.67
(SEC.) = 25.24 FLOW DEPTH (FEET) = 2.44
= 1.27 Tc(MIN.) = 20.20
ROM NODE 20100.00 TO NODE 20110.00 = 10158.54 FEET.
****************
NODE 20110.00 TO NODE 20110.00 IS CODE = 81
._____
JBAREA TO MAINLINE PEAK FLOW<
20.20
L INTENSITY (INCH/HR) = 1.980
DATA (AMC II):
    SCS SOIL AREA
                 Fр
                         Ар
    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      Α
           5.83 0.86 1.000 46
```

File name: LR0201ZZ.RES

Page 10

"3-4 DWELLINGS/ACRE"	A	33.80	0.98	0.600	32	RESIDENTIAL
RESIDENTIAL						"3-4 DWELLINGS/ACRE" B 31.56 0.75 0.600 56
"3-4 DWELLINGS/ACRE"	В	25.19	0.75	0.600	56	NATURAL FAIR COVER
RESIDENTIAL	_					"OPEN BRUSH" B 41.72 0.61 1.000 66
"2 DWELLINGS/ACRE"	В	9.84	0.75	0.700	56	RESIDENTIAL
NATURAL FAIR COVER						".4 DWELLING/ACRE" B 5.26 0.75 0.900 56
"OPEN BRUSH"	В	45.99	0.61	1.000	66	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
SUBAREA AVERAGE PERVIOU				.74		SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.815
SUBAREA AVERAGE PERVIOU	JS AREA FRA	.CTION, Ap	= 0.780			SUBAREA AREA(ACRES) = 138.21
SUBAREA AREA(ACRES) =	120.65					UNIT-HYDROGRAPH DATA:
UNIT-HYDROGRAPH DATA:						RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
RAINFALL(INCH): 5M= 0.3	38;30M= 0.7	8;1H= 1.03	3;3H= 1.91;	:6H= 2.83;	24H= 6.12	S-GRAPH: VALLEY(DEV.) = 37.1%; VALLEY(UNDEV.)/DESERT= 62.9%
S-GRAPH: VALLEY(DEV.)=	35.7%; VALL!	EY (UNDEV.)	/DESERT= 6	54.3%		MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
MOUNTAIN= 0.0	ე%;FOOTHILL:	= 0.0%;DF	SERT (UNDEV	7.)= 0.09	5	Tc(HR) = 0.35; $LAG(HR) = 0.28$ ; $Fm(INCH/HR) = 0.59$ ; $Ybar = 0.58$
Tc(HR) = 0.34; LAG(HR)	= 0.27; Fm	(INCH/HR)	= 0.58; Yh	par = 0.57	7	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
USED SIERRA MADRE DEPTH	H-AREA CURV	ES WITH AM	4C II COND	OITION.		DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
DEPTH-AREA FACTORS: 5M	= 0.96; 301	M = 0.96;	1HR = 0.96	5 <b>;</b>		3HR = 0.99; 6HR = 1.00; 24HR= 1.00
3HR = 0.99; 6HR = 1.00;	; 24HR= 1.0	0				UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 949.0
UNIT-INTERVAL(MIN) = 2	2.50 TOTA	L AREA (ACF	₹ES) =	810.8		LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20111.00 = 11086.87 FEET.
LONGEST FLOWPATH FROM N	NODE 20100	.00 TO NOI	DE 20110.0	00 = 101	158.54 FEET.	EQUIVALENT BASIN FACTOR APPROXIMATIONS:
EQUIVALENT BASIN FACTO	OR APPROXIM	ATIONS:				Lca/L=0.3,n=.0291; Lca/L=0.4,n=.0261; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.022
Lca/L=0.3,n=.0303; Lca	a/L=0.4,n=.	0271; Lca/	$^{\prime}L=0.5, n=.0$	0249;Lca/I	L=0.6,n=.0233	TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 225.07
TIME OF PEAK FLOW(HR) =	= 16.33 RU	NOFF VOLUN	4Ε (AF) =	195.59	,	UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1123.46
UNIT-HYDROGRAPH PEAK FI			. ,			TOTAL AREA(ACRES) = 949.0 PEAK FLOW RATE(CFS) = 1123.46
TOTAL AREA (ACRES) =	810.8	PEAK F	TLOW RATE (C	CFS) =	987.06	
, , ,			,	,		SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
SUBAREA AREA-AVERAGED R	RAINFALL DE	PTH (INCH):	:			5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
5M = 0.38; 30M = 0.78;		, ,		2 83 • 241	IR = 6 12	
>>>>COMPUTE TRAPEZOIDA	AL CHANNEL	FLOW<				>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<< >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
	,		*			ELEVATION DATA: UPSTREAM(FEET) = 1920.00 DOWNSTREAM(FEET) = 1870.00
ELEVATION DATA: UPSTREA	AM(FEET) =	1960.00	DOWNSTREA	AM(FEET) =	= 1920.00	CHANNEL LENGTH THRU SUBAREA (FEET) = 1664.97 CHANNEL SLOPE = 0.0300
CHANNEL LENGTH THRU SUE	, ,			, ,		CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
CHANNEL BASE (FEET) =						MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
MANNING'S FACTOR = 0.01				.00		CHANNEL FLOW THRU SUBAREA(CFS) = 1123.46
CHANNEL FLOW THRU SUBAR			,			FLOW VELOCITY (FEET/SEC.) = 26.44 FLOW DEPTH (FEET) = 2.74
FLOW VELOCITY (FEET/SEC.	. ,			= 2.32		TRAVEL TIME (MIN.) = $1.05$ Tc (MIN.) = $21.78$
TRAVEL TIME (MIN.) = 0						LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20112.00 = 12751.84 FEET.
LONGEST FLOWPATH FROM N	NODE 20100	.00 TO NOI	DE 20111.0	00 = 110	086.87 FEET.	
						************************
*******	*****	******	********	******	******	FLOW PROCESS FROM NODE 20112.00 TO NODE 20112.00 IS CODE = 81
FLOW PROCESS FROM NODE	20111 00 '	TO NODE :	20111 00 TS	S CODE =	81	
						>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
>>>>ADDITION OF SUBARE	EA TO MAINI.	TNE DEAK I	T.OW<			======================================
======================================						MAINLINE Tc(MIN.) = 21.78
MAINLINE Tc(MIN.) = 2						* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.892
* 25 YEAR RAINFALL INT		u/up) - 1	0/0			SUBAREA LOSS RATE DATA (AMC II):
SUBAREA LOSS RATE DATA(		11,1111, - 1	. • ノユノ			DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
DEVELOPMENT TYPE/	SCS SOIL	ARFA	Fn	Δn	SCS	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
			Fp (INCH/HR)	Ap		RESIDENTIAL
LAND USE	GROUP	(UCVES)	'TMCU/HK)	(DECTMAT)	CIN	
NATURAL FAIR COVER	7	20 50	0.06	1 000	16	"3-4 DWELLINGS/ACRE" A 8.51 0.98 0.600 32
"OPEN BRUSH"	A	28.59	0.86	1.000	46	RESIDENTIAL
RESIDENTIAL	7	21 00	0.00	0 000	20	"3-4 DWELLINGS/ACRE" B 0.54 0.75 0.600 56
"3-4 DWELLINGS/ACRE"	A	31.08	0.98	0.600	32	RESIDENTIAL
Date: 04/21/2014	File name	e: LR0201ZZ.I	RES		Page 11	Date: 04/21/2014 File name: LR0201ZZ.RES Page 12

```
".4 DWELLING/ACRE"
                      A 3.29
                                         0.98
                                                0.900
                                                        32
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                               75.85
                                         0.75
                                                0.900
                                                        56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                        В
                                7.12
                                         0.61
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.879
 SUBAREA AREA(ACRES) = 95.31
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
 S-GRAPH: VALLEY(DEV.) = 34.6%; VALLEY(UNDEV.) / DESERT = 65.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.36; LAG(HR) = 0.29; Fm(INCH/HR) = 0.60; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 1044.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20112.00 = 12751.84 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224; Lca/L=0.6,n=.0209
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 244.19
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1169.21
 TOTAL AREA(ACRES) = 1044.3
                                 PEAK FLOW RATE (CFS) = 1169.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20112.00 TO NODE 20150.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 907.32 CHANNEL SLOPE = 0.0220
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1169.21
 FLOW VELOCITY (FEET/SEC.) = 23.90 FLOW DEPTH (FEET) = 3.04
 TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 22.41
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
********************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 22.41
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.860
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fр
                                                 Aр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                              4.19
                                         0.75
                                                0.600
                                                       56
 RESIDENTIAL
                              3.83
                                                0.900
 ".4 DWELLING/ACRE"
                        В
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743
```

```
SUBAREA AREA(ACRES) = 8.02
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
 S-GRAPH: VALLEY(DEV.) = 34.7%; VALLEY(UNDEV.) / DESERT = 65.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.37; LAG(HR) = 0.30; Fm(INCH/HR) = 0.60; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 1052.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0265; Lca/L=0.4,n=.0237; Lca/L=0.5,n=.0218; Lca/L=0.6,n=.0203
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 248.19
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1150.14
 TOTAL AREA (ACRES) = 1052.3
                                PEAK FLOW RATE (CFS) = 1169.21
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20120.00 TO NODE 20121.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 591.56
 ELEVATION DATA: UPSTREAM(FEET) = 3148.00 DOWNSTREAM(FEET) = 2920.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.975
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.854
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Aр
                                                       SCS Tc
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                               5.75
                                       0.61 1.000
                                                        66 10.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF (CFS) = 11.59
                   5.75 PEAK FLOW RATE (CFS) = 11.59
 TOTAL AREA (ACRES) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*****************
 FLOW PROCESS FROM NODE 20121.00 TO NODE 20122.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 13 Date: 04/21/2014 File name: LR0201ZZ.RES Page 14

```
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2860.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 401.18 CHANNEL SLOPE = 0.1496
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             11.59
 FLOW VELOCITY (FEET/SEC.) = 6.75 FLOW DEPTH (FEET) = 0.83
 TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 11.97
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20122.00 = 992.74 FEET.
*******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20122.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 11.97
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.710
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                          Ар
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                           6.02
                                    0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 6.02 SUBAREA RUNOFF(CFS) = 11.36
 EFFECTIVE AREA(ACRES) = 11.77 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 11.8
                           PEAK FLOW RATE(CFS) =
                                                   22.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20123.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2860.00 DOWNSTREAM(FEET) = 2800.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 404.41 CHANNEL SLOPE = 0.1484
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 22.20
 FLOW VELOCITY (FEET/SEC.) = 7.94 FLOW DEPTH (FEET) = 1.06
 TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 12.81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20123.00 = 1397.15 FEET.
*****************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20123.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 12.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.601
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            αA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             5.11
                                    0.61
                                           1.000 66
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.11
                            SUBAREA RUNOFF(CFS) = 9.14
 EFFECTIVE AREA(ACRES) = 16.88 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 16.9
                              PEAK FLOW RATE(CFS) =
                                                   30.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*****************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20124.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2720.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 734.74 CHANNEL SLOPE = 0.1089
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              30.18
 FLOW VELOCITY (FEET/SEC.) = 7.58 FLOW DEPTH (FEET) = 1.26
 TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 14.43
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20124.00 = 2131.89 FEET.
*******************
 FLOW PROCESS FROM NODE 20124.00 TO NODE 20124.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE TC(MIN.) = 14.43
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.422
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                            33.25
                                     0.61 1.000
 "OPEN BRUSH"
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 33.25 SUBAREA RUNOFF (CFS) = 54.11
 EFFECTIVE AREA(ACRES) = 50.13 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 50.1 PEAK FLOW RATE(CFS) =
                                                 81.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20124.00 TO NODE 20125.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2720.00 DOWNSTREAM(FEET) = 2620.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 932.28 CHANNEL SLOPE = 0.1073
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 15

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 16

```
FLOW VELOCITY (FEET/SEC.) = 9.70 FLOW DEPTH (FEET) = 1.83
 TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 16.03
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20125.00 = 3064.17 FEET.
******************
 FLOW PROCESS FROM NODE 20125.00 TO NODE 20125.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.03
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.274
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
                                            Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                            36.51 0.61 1.000 66
 "OPEN BRUSH"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 36.51 SUBAREA RUNOFF(CFS) = 54.54
 EFFECTIVE AREA(ACRES) = 86.64 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 86.6 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
FLOW PROCESS FROM NODE 20125.00 TO NODE 20126.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2620.00 DOWNSTREAM(FEET) = 2600.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1333.93 CHANNEL SLOPE = 0.0150
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             129.43
 FLOW VELOCITY (FEET/SEC.) = 5.20 FLOW DEPTH (FEET) = 3.15
 TRAVEL TIME (MIN.) = 4.27 Tc (MIN.) = 20.30
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20126.00 = 4398.10 FEET.
******************
 FLOW PROCESS FROM NODE 20126.00 TO NODE 20126.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 20.30
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.973
 SUBAREA LOSS RATE DATA (AMC II):
                                           Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                             60.59
                                     0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 60.59
                            SUBAREA RUNOFF (CFS) = 74.13
 EFFECTIVE AREA(ACRES) = 147.23 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
```

```
TOTAL AREA(ACRES) = 147.2
                            PEAK FLOW RATE(CFS) =
                                              180.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
FLOW PROCESS FROM NODE 20126.00 TO NODE 20127.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1404.24 CHANNEL SLOPE = 0.1282
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 180.12
 FLOW VELOCITY (FEET/SEC.) = 9.86 FLOW DEPTH (FEET) = 0.84
 TRAVEL TIME (MIN.) = 2.37 Tc (MIN.) = 22.67
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20127.00 = 5802.34 FEET.
*******************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20127.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 22.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.847
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   В
                          45.37 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 45.37 SUBAREA RUNOFF (CFS) = 50.34
 EFFECTIVE AREA(ACRES) = 192.60 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 192.6 PEAK FLOW RATE (CFS) = 213.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
********************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20128.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.58 CHANNEL SLOPE = 0.1444
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 213.68
 FLOW VELOCITY (FEET/SEC.) = 9.63 FLOW DEPTH (FEET) = 0.71
 TRAVEL TIME (MIN.) = 2.16 Tc (MIN.) = 24.83
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20128.00 = 7048.92 FEET.
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 17 Date: 04/21/2014 File name: LR0201ZZ.RES Page 18

CHANNEL LENGTH THRU SUBAREA (FEET) = 1393.78 CHANNEL SLOPE = 0.0861 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00 CHANNEL FLOW THRU SUBAREA(CFS) = 234.60 FLOW VELOCITY (FEET/SEC.) = 8.47 FLOW DEPTH (FEET) = 0.87 TRAVEL TIME (MIN.) = 2.74 Tc (MIN.) = 27.58LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20129.00 = 8442.70 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20129.00 TO NODE 20129.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_

MAINLINE Tc(MIN.) = 27.58\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.642 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ

Ар LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN NATURAL FAIR COVER "OPEN BRUSH" 18.57 0.61 1.000 RESIDENTIAL в 10.38 "2 DWELLINGS/ACRE" 0.75 0.700 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892 SUBAREA AREA(ACRES) = 28.95 SUBAREA RUNOFF(CFS) = 27.63EFFECTIVE AREA(ACRES) = 258.00 AREA-AVERAGED Fm(INCH/HR) = 0.61 AREA-AVERAGED Fp (INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.98 TOTAL AREA (ACRES) = 258.0 PEAK FLOW RATE (CFS) = 240.27

5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 10129.00 TO NODE 20130.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 1995.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 2018.40 CHANNEL SLOPE = 0.0619 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00 CHANNEL FLOW THRU SUBAREA (CFS) = 240.27 FLOW VELOCITY (FEET/SEC.) = 7.72 FLOW DEPTH (FEET) = 0.97 TRAVEL TIME (MIN.) = 4.36 Tc (MIN.) = 31.93LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20130.00 = 10461.10 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20130.00 TO NODE 20130.00 IS CODE = 81 \_\_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc (MIN.) = 31.93\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.504 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр Ар SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL ".4 DWELLING/ACRE" 28.04 0.75 0.900 56 NATURAL FAIR COVER "OPEN BRUSH" 51.49 0.61 1.000 RESIDENTIAL "2 DWELLINGS/ACRE" 30.71 0.75 0.700 56 В SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891 SUBAREA AREA(ACRES) = 110.24 SUBAREA RUNOFF(CFS) = 89.29 EFFECTIVE AREA(ACRES) = 368.24 AREA-AVERAGED Fm(INCH/HR) = 0.61 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95 TOTAL AREA(ACRES) = 368.2 PEAK FLOW RATE(CFS) = 297.44 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20130.00 TO NODE 20148.00 IS CODE = 54 ..... >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1995.00 DOWNSTREAM(FEET) = 1925.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.14 CHANNEL SLOPE = 0.0562 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00 CHANNEL FLOW THRU SUBAREA(CFS) = 297.44 FLOW VELOCITY (FEET/SEC.) = 8.09 FLOW DEPTH (FEET) = 1.14 TRAVEL TIME (MIN.) = 2.57 Tc (MIN.) = 34.50

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 20

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 34.50
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.436
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                            Ap SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 19.93
                                            0.900
                                     0.75
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65
                                    0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 20.58 SUBAREA RUNOFF(CFS) = 14.25
 EFFECTIVE AREA(ACRES) = 388.82 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95
 TOTAL AREA(ACRES) = 388.8
                            PEAK FLOW RATE (CFS) = 297.44
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 34.50
 RAINFALL INTENSITY (INCH/HR) = 1.44
 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.64
 AREA-AVERAGED Ap = 0.95
 EFFECTIVE STREAM AREA(ACRES) = 388.82
 TOTAL STREAM AREA(ACRES) = 388.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                297.44
******************
 FLOW PROCESS FROM NODE 20140.00 TO NODE 20141.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 823.61
 ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.588
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.629
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                    Fρ
                                                  SCS Tc
                                            Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
      Date: 04/21/2014 File name: LR0201ZZ.RES
                                                 Page 21
```

```
"OPEN BRUSH"
                      B 8.14 0.61 1.000 66 12.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF (CFS) = 14.76
 TOTAL AREA (ACRES) = 8.14 PEAK FLOW RATE (CFS) =
                                            14.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20141.00 TO NODE 20142.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2690.00 DOWNSTREAM(FEET) = 2560.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 610.78 CHANNEL SLOPE = 0.2128
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             14 76
 FLOW VELOCITY (FEET/SEC.) = 8.18 FLOW DEPTH (FEET) = 0.85
 TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 13.83
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20142.00 = 1434.39 FEET.
*******************
 FLOW PROCESS FROM NODE 20142.00 TO NODE 20142.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.83
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.484
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                           15.44
                                     0.61 1.000
 "OPEN BRUSH"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 15.44
                           SUBAREA RUNOFF (CFS) = 25.99
 EFFECTIVE AREA(ACRES) = 23.58 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 23.6 PEAK FLOW RATE (CFS) =
                                                 39.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20142.00 TO NODE 20143.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2560.00 DOWNSTREAM(FEET) = 2420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 771.13 CHANNEL SLOPE = 0.1816
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

File name: LR0201ZZ.RES

Page 22

NATURAL FAIR COVER

Date: 04/21/2014

```
FLOW VELOCITY (FEET/SEC.) = 9.85 FLOW DEPTH (FEET) = 1.27
 TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 15.14
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20143.00 = 2205.52 FEET.
*****************
 FLOW PROCESS FROM NODE 20143.00 TO NODE 20143.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 15.14
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.353
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           22.70 0.61 1.000 66
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 22.70 SUBAREA RUNOFF(CFS) = 35.54
 EFFECTIVE AREA(ACRES) = 46.28 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 46.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
FLOW PROCESS FROM NODE 20143.00 TO NODE 20144.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1310.58 CHANNEL SLOPE = 0.1373
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              72.45
 FLOW VELOCITY (FEET/SEC.) = 10.35 FLOW DEPTH (FEET) = 1.67
 TRAVEL TIME (MIN.) = 2.11 Tc (MIN.) = 17.25
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20144.00 = 3516.10 FEET.
*****************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20144.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 17.25
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.176
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                           αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В 61.27
                                     0.61
                                            1.000
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 11.25
                                     0.75
                                            0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984
 SUBAREA AREA (ACRES) = 72.52
                            SUBAREA RUNOFF (CFS) = 101.35
```

```
AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 118.8 PEAK FLOW RATE (CFS) =
                                                166.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*******************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20145.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1185.29 CHANNEL SLOPE = 0.0759
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             166.42
 FLOW VELOCITY (FEET/SEC.) = 10.35 FLOW DEPTH (FEET) = 1.85
 TRAVEL TIME (MIN.) = 1.91 Tc (MIN.) = 19.16
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20145.00 = 4701.39 FEET.
FLOW PROCESS FROM NODE 20145.00 TO NODE 20145.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE TC(MIN.) = 19.16
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.043
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В 27.90
                                     0.61 1.000
                                                   66
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    B 18.45
                                    0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960
 SUBAREA AREA(ACRES) = 46.35
                            SUBAREA RUNOFF (CFS) = 58.64
 EFFECTIVE AREA(ACRES) = 165.15 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) = 165.1
                              PEAK FLOW RATE(CFS) =
                                                  210.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20145.00 TO NODE 20146.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2065.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1106.66 CHANNEL SLOPE = 0.0768
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 210.85
 FLOW VELOCITY (FEET/SEC.) = 11.08 FLOW DEPTH (FEET) = 2.08
      Date: 04/21/2014 File name: LR0201ZZ.RES
```

Page 24

EFFECTIVE AREA(ACRES) = 118.80 AREA-AVERAGED Fm(INCH/HR) = 0.62

Date: 04/21/2014 File name: LR0201ZZ.RES Page 23

```
TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 20.82
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20146.00 = 5808.05 FEET.
FLOW PROCESS FROM NODE 20146.00 TO NODE 20146.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 20.82
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.944
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                             5.66
                                      0.61
                                             1.000
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В 28.22
                                     0.75
                                           0.900
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917
 SUBAREA AREA(ACRES) = 33.88
                             SUBAREA RUNOFF (CFS) = 39.04
 EFFECTIVE AREA(ACRES) = 199.03 AREA-AVERAGED Fm(INCH/HR) = 0.63
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 199.0
                              PEAK FLOW RATE(CFS) =
                                                   235.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*****************
 FLOW PROCESS FROM NODE 20146.00 TO NODE 20147.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2065.00 DOWNSTREAM(FEET) = 1980.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1084.55 CHANNEL SLOPE = 0.0784
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 235.08
 FLOW VELOCITY (FEET/SEC.) = 11.48 FLOW DEPTH (FEET) = 2.18
 TRAVEL TIME (MIN.) = 1.57 Tc (MIN.) = 22.40
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20147.00 = 6892.60 FEET.
********************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20147.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 22.40
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.860
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fр
                                             Αр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В
                            15.70
                                   0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA (ACRES) = 15.70 SUBAREA RUNOFF (CFS) = 16.78
 EFFECTIVE AREA(ACRES) = 214.73 AREA-AVERAGED Fm(INCH/HR) = 0.63
```

```
214.7
                                                 236.96
 TOTAL AREA (ACRES) =
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20148.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1925.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 934.91 CHANNEL SLOPE = 0.0588
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                           236.96
 FLOW VELOCITY (FEET/SEC.) = 10.36 FLOW DEPTH (FEET) = 2.35
 TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 23.90
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20148.00 = 7827.51 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 23.90
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.789
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                           αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 14.97
                                   0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA (ACRES) = 14.97 SUBAREA RUNOFF (CFS) = 15.04
 EFFECTIVE AREA(ACRES) = 229.70 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.96
 TOTAL AREA(ACRES) = 229.7
                             PEAK FLOW RATE(CFS) =
                                                 238.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.90
 RAINFALL INTENSITY (INCH/HR) = 1.79
 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp (INCH/HR) = 0.66
 AREA-AVERAGED Ap = 0.96
 EFFECTIVE STREAM AREA(ACRES) = 229.70
 TOTAL STREAM AREA (ACRES) = 229.70
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 26

AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.97

Date: 04/21/2014 File name: LR0201ZZ.RES Page 25

```
** CONFLUENCE DATA **
  STREAM
         0
                Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          297.44 34.50 1.436 0.64(0.61) 0.95 388.8 20120.00
    2
          238.25 23.90 1.789 0.66(0.64)0.96
                                            229.7 20140.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          532.53 23.90 1.789 0.65(0.62) 0.95 499.1 20140.00
          462.57 34.50 1.436 0.65(0.62) 0.95 618.5 20120.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 532.53 Tc (MIN.) = 23.90
 EFFECTIVE AREA(ACRES) = 499.06 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 618.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20149.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1925.00 DOWNSTREAM(FEET) = 1900.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 764.60 CHANNEL SLOPE = 0.0327
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 532.53
 FLOW VELOCITY (FEET/SEC.) = 10.02 FLOW DEPTH (FEET) = 3.23
 TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 25.17
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20149.00 = 12471.84 FEET.
*********************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20149.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 25.17
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.734
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                             Aр
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 20.34
                                     0.75
                                             0.900
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.62
                                     0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 20.96
                            SUBAREA RUNOFF (CFS) = 20.15
 EFFECTIVE AREA(ACRES) = 520.02 AREA-AVERAGED Fm(INCH/HR) = 0.62
```

```
TOTAL AREA (ACRES) = 639.5 PEAK FLOW RATE (CFS) =
                                                 532.53
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
**********************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20150.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1212.57 CHANNEL SLOPE = 0.0412
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 532.53
 FLOW VELOCITY (FEET/SEC.) = 10.90 FLOW DEPTH (FEET) = 3.04
 TRAVEL TIME (MIN.) = 1.85 Tc (MIN.) = 27.03
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 27.03
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.662
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                            αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 8.58
                                      0.75
                                             0.900
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           0.10 0.75 0.600
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA AREA(ACRES) = 8.68
                            SUBAREA RUNOFF (CFS) = 7.75
 EFFECTIVE AREA(ACRES) = 528.70 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95
 TOTAL AREA(ACRES) = 648.2
                              PEAK FLOW RATE (CFS) = 532.53
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
_____
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
 S-GRAPH: VALLEY(DEV.) = 7.9%; VALLEY(UNDEV.) / DESERT = 92.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.62; Ybar = 0.60
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
```

Date: 04/21/2014 File name: LR020177.RFS Page 27

AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95

File name: LR0201ZZ.RES

Date: 04/21/2014

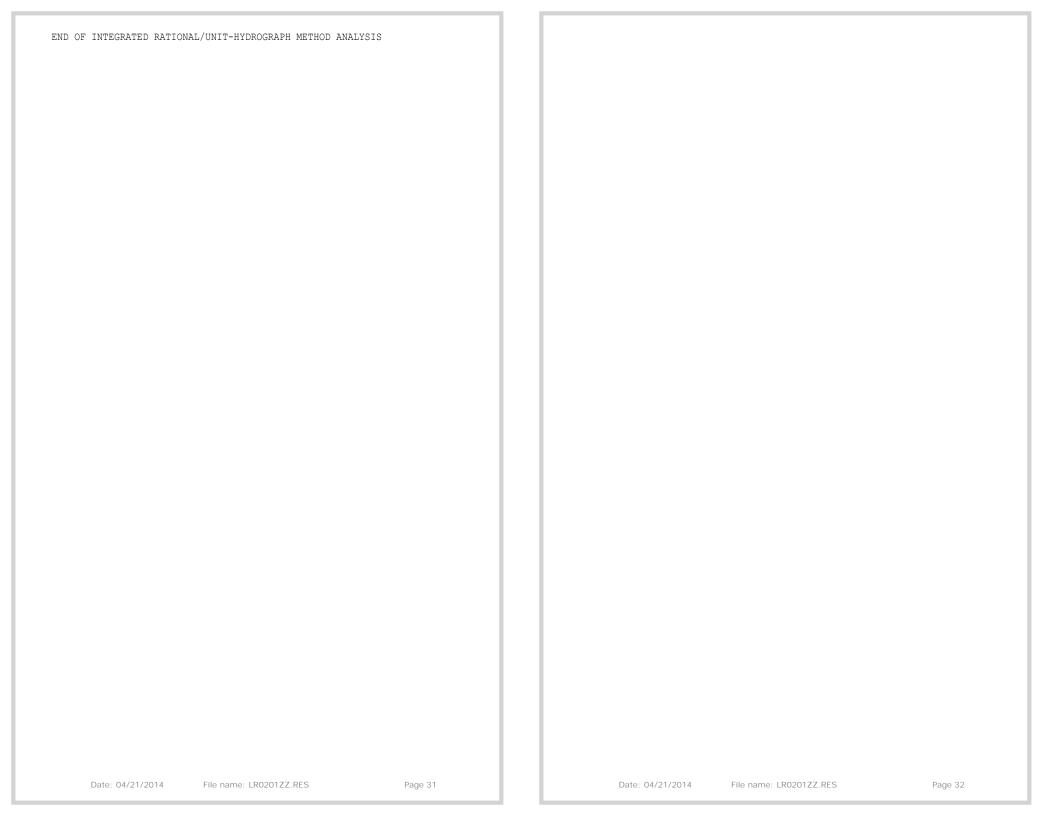
Page 28

```
DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0524; Lca/L=0.4,n=.0469; Lca/L=0.5,n=.0431; Lca/L=0.6,n=.0402
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 142.13
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 486.50
 TOTAL PEAK FLOW RATE (CFS) = 486.50 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 532.53
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 532.53)
 PEAK FLOW RATE (CFS) USED = 532.53
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 532.53 Tc (MIN.) = 37.75
 AREA-AVERAGED Fm(INCH/HR) = 0.62 Ybar = 0.60
 TOTAL AREA (ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1169.21 Tc (MIN.) = 22.41
 AREA-AVERAGED Fm (INCH/HR) = 0.60 Ybar = 0.58
 TOTAL AREA(ACRES) = 1052.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
 S-GRAPH: VALLEY(DEV.) = 24.5%; VALLEY(UNDEV.) / DESERT= 75.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.61; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1700.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0524; Lca/L=0.4,n=.0469; Lca/L=0.5,n=.0431; Lca/L=0.6,n=.0402
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 378.11
 PEAK FLOW RATE (CFS) = 1238.39
*******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20151.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1850.00 DOWNSTREAM(FEET) = 1785.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1753.77 CHANNEL SLOPE = 0.0371
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1238.39
 FLOW VELOCITY (FEET/SEC.) = 29.28 FLOW DEPTH (FEET) = 2.73
 TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 38.75
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 38.75
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.339
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                                    Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В
                              24.58 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA(ACRES) = 24.58
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.91;6H= 2.83;24H= 6.12
 S-GRAPH: VALLEY(DEV.) = 24.1%; VALLEY(UNDEV.) / DESERT= 75.9%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.65; LAG(HR) = 0.52; Fm(INCH/HR) = 0.61; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0484; Lca/L=0.4,n=.0434; Lca/L=0.5,n=.0398; Lca/L=0.6,n=.0372
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 382.68
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1228.61
 TOTAL AREA(ACRES) = 1725.0 PEAK FLOW RATE(CFS) = 1238.39
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
*******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<< <
______
 PEAK FLOWRATE TABLE FILE NAME: 20151.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1725.0 TC (MIN.) =
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.59
 PEAK FLOW RATE (CFS) = 1238.39
```

\_\_\_\_\_

Date: 04/21/2014 File name: LR0201ZZ.RES Page 29 Date: 04/21/2014 File name: LR0201ZZ.RES Page 30



\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\*

17 20.0

18 26.0

10.0

15.0

NEDERINDO FILD OLDRILL

.

\* RATIONAL METHOD HYDROLOGY - TO NODE 20274

\*

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*

FILE NAME: LR0202ZZ.DAT

TIME/DATE OF STUDY: 15:54 10/25/2013

HIGER OPECIFIED HANDOLOGA AND HANDAHLLO WODEL INFORMATION.

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

\_\_\_\_\_\_

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9900

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 0.67 2.00 0.0312 0.167 0.0180 20.0 0.020/0.020/0.020 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20200.00 TO NODE 20201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 508.83 ELEVATION DATA: UPSTREAM(FEET) = 1945.00 DOWNSTREAM(FEET) = 1935.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.936 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.749 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" A 4.64 0.98 0.600 32 10.94 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA RUNOFF (CFS) = 9.04TOTAL AREA (ACRES) = 4.64 PEAK FLOW RATE (CFS) = 9.04 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20201.00 TO NODE 20202.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA< \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1935.00 DOWNSTREAM NODE ELEVATION (FEET) = 1930.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 620.72 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700 Date: 04/21/2014 File name: LR020277.RFS Page 2

0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

0.020/0.020/0.020 0.67

Date: 04/21/2014 File name: LR0202ZZ.RES Page 1

```
"3-4 DWELLINGS/ACRE" A 11.02 0.98 0.600 32
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.331
                                                                                MOBILE HOME PARK A 0.23 0.98 0.250 32
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.593
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA (ACRES) = 11.25 SUBAREA RUNOFF (CFS) = 16.72
     LAND USE
                                                                                EFFECTIVE AREA(ACRES) = 22.21 AREA-AVERAGED Fm(INCH/HR) = 0.58
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.32 0.98 0.600 32
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                TOTAL AREA (ACRES) = 22.2 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.01
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 2.99
 AVERAGE FLOW DEPTH (FEET) = 0.59 FLOOD WIDTH (FEET) = 30.86
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.46 Tc (MIN.) = 14.39
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 6.32 SUBAREA RUNOFF (CFS) = 9.93
                                                                                DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 16.18
 EFFECTIVE AREA(ACRES) = 10.96 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                               FLOW VELOCITY (FEET/SEC.) = 5.87 DEPTH*VELOCITY (FT*FT/SEC.) = 2.83
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
                                                                               LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20203.00 = 1499.05 FEET.
 TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) = 17.23
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 20203.00 TO NODE 20204.00 IS CODE = 63
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                              ______
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                               >>>> (STREET TABLE SECTION # 13 USED) <<<<
 DEPTH(FEET) = 0.61 FLOOD WIDTH(FEET) = 34.14
                                                                              _____
 FLOW VELOCITY (FEET/SEC.) = 3.08 DEPTH*VELOCITY (FT*FT/SEC) = 1.89
                                                                               UPSTREAM ELEVATION(FEET) = 1910.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20202.00 = 1129.55 FEET.
                                                                               STREET LENGTH (FEET) = 418.06 CURB HEIGHT (INCHES) = 8.0
                                                                               STREET HALFWIDTH (FEET) = 32.00
*****
 FLOW PROCESS FROM NODE 20202.00 TO NODE 20203.00 IS CODE = 63
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1930.00 DOWNSTREAM ELEVATION(FEET) = 1910.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 369.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 STREET FLOW DEPTH(FEET) = 0.55
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 19.62
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.59
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.45
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 6.00
   HALFSTREET FLOOD WIDTH (FEET) = 14.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.48
 STREET FLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 15.51
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.229
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.32
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.93
STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc(MIN.) = 16.82
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.123
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
   LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                     0.98 0.600 32
MOBILE HOME PARK A 6.97 0.98 0.250 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
SUBAREA AREA (ACRES) = 12.97 SUBAREA RUNOFF (CFS) = 20.10
EFFECTIVE AREA(ACRES) = 35.18 AREA-AVERAGED Fm(INCH/HR) = 0.52
AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.53
TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) =
                                                         50.91
      Date: 04/21/2014
                     File name: LR0202ZZ.RES
                                                       Page 4
```

32.93

Date: 04/21/2014 File name: LR0202ZZ.RES Page 3

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 20.95
 FLOW VELOCITY(FEET/SEC.) = 5.56 DEPTH*VELOCITY(FT*FT/SEC.) = 3.21
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20204.00 = 1917.11 FEET.
********************
 FLOW PROCESS FROM NODE 20204.00 TO NODE 20205.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1895.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 555.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 22.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.60
 STREET FLOW TRAVEL TIME (MIN.) = 1.57 Tc (MIN.) = 18.40
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.012
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 8.31
                                       0.98 0.600 32
 MOBILE HOME PARK A 8.55 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.423
 SUBAREA AREA(ACRES) = 16.86 SUBAREA RUNOFF(CFS) = 24.28
 EFFECTIVE AREA(ACRES) = 52.04 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.49
 TOTAL AREA(ACRES) = 52.0 PEAK FLOW RATE(CFS) = 71.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 23.91
 FLOW VELOCITY (FEET/SEC.) = 6.07 DEPTH*VELOCITY (FT*FT/SEC.) = 3.86
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20205.00 = 2472.11 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1875.00 DOWNSTREAM ELEVATION (FEET) = 1855.00
 STREET LENGTH (FEET) = 568.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   76.12
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.96
 STREET FLOW TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 19.95
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.917
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK A 4.58 0.98 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.65 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA (ACRES) = 6.23 SUBAREA RUNOFF (CFS) = 8.87
 EFFECTIVE AREA (ACRES) = 58.27 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.48
 TOTAL AREA(ACRES) = 58.3 PEAK FLOW RATE(CFS) =
                                                         76.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.62
 FLOW VELOCITY (FEET/SEC.) = 6.09 DEPTH*VELOCITY (FT*FT/SEC.) = 3.96
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20206.00 = 3040.11 FEET.
*****************
 FLOW PROCESS FROM NODE 20206.00 TO NODE 20214.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1855.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
 STREET LENGTH (FEET) = 411.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
```

FLOW PROCESS FROM NODE 20205.00 TO NODE 20206.00 IS CODE = 63

Date: 04/21/2014 File name: LR0202ZZ.RES Page 5

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 6

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.21
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.04
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc(MIN.) = 21.05
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.856
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     A 1.68 0.98 0.250 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.62 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344
 SUBAREA AREA (ACRES) = 2.30 SUBAREA RUNOFF (CFS) = 3.15
 EFFECTIVE AREA(ACRES) = 60.57 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.47
 TOTAL AREA(ACRES) = 60.6 PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.65 HALFSTREET FLOOD WIDTH (FEET) = 24.46
 FLOW VELOCITY (FEET/SEC.) = 6.16 DEPTH*VELOCITY (FT*FT/SEC.) = 3.99
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET.
******************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.05
 RAINFALL INTENSITY (INCH/HR) = 1.86
 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.97
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 60.57
 TOTAL STREAM AREA(ACRES) = 60.57
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
******************
 FLOW PROCESS FROM NODE 20210.00 TO NODE 20211.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 940.61
 ELEVATION DATA: UPSTREAM(FEET) = 1875.00 DOWNSTREAM(FEET) = 1850.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 13.163
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.460
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                             7.95 0.98 0.600 32 13.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 13.41
 TOTAL AREA(ACRES) = 7.95 PEAK FLOW RATE(CFS) = 13.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*************************
 FLOW PROCESS FROM NODE 20211.00 TO NODE 20212.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1850.00 DOWNSTREAM ELEVATION(FEET) = 1846.00
 STREET LENGTH (FEET) = 247.17 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.44
 STREET FLOW TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 14.46
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.325
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                              4.82 0.98 0.600
                                                        32
                      A
 MOBILE HOME PARK A
                             0.55 0.98 0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 7

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564
 SUBAREA AREA (ACRES) = 5.37 SUBAREA RUNOFF (CFS) = 8.58
 EFFECTIVE AREA(ACRES) = 13.32 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 13.3 PEAK FLOW RATE (CFS) = 21.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.49
 FLOW VELOCITY(FEET/SEC.) = 3.31 DEPTH*VELOCITY(FT*FT/SEC.) = 1.58
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20212.00 = 1187.78 FEET.
*****************
 FLOW PROCESS FROM NODE 20212.00 TO NODE 20213.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1846.00 DOWNSTREAM ELEVATION(FEET) = 1843.00
 STREET LENGTH (FEET) = 253.21 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 19.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.67
 STREET FLOW TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 15.77
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.207
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESTDENTIAL
                                        0.98 0.600 32
 "3-4 DWELLINGS/ACRE"
                    A 2.35
                               3.23
                                                0.250 32
 MOBILE HOME PARK
                      A
                                        0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.397
 SUBAREA AREA(ACRES) = 5.58 SUBAREA RUNOFF(CFS) = 9.14
 EFFECTIVE AREA(ACRES) = 18.90 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = 28.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
```

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.84
 FLOW VELOCITY (FEET/SEC.) = 3.34 DEPTH*VELOCITY (FT*FT/SEC.) = 1.79
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20213.00 = 1440.99 FEET.
*******************
 FLOW PROCESS FROM NODE 20213.00 TO NODE 20214.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1843.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
 STREET LENGTH (FEET) = 294.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  30.54
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.82
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.81
 STREET FLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 17.28
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.089
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.63 0.98 0.600 32
 MOBILE HOME PARK
                             1.65 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.347
 SUBAREA AREA (ACRES) = 2.28 SUBAREA RUNOFF (CFS) = 3.59
 EFFECTIVE AREA(ACRES) = 21.18 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51
 TOTAL AREA(ACRES) = 21.2 PEAK FLOW RATE(CFS) =
                                                        30.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.56 HALFSTREET FLOOD WIDTH (FEET) = 20.76
 FLOW VELOCITY (FEET/SEC.) = 3.24 DEPTH*VELOCITY (FT*FT/SEC.) = 1.80
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20214.00 = 1735.24 FEET.
******************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 9 Date: 04/21/2014 File name: LR0202ZZ.RES

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW DEPTH (FEET) = 0.75
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 33.66
_____
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.12
 TOTAL NUMBER OF STREAMS = 2
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.34
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.82 Tc (MIN.) = 20.11
 TIME OF CONCENTRATION (MIN.) = 17.28
                                                                                * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.908
 RAINFALL INTENSITY (INCH/HR) = 2.09
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
                                                                                                                                     SCS
 AREA-AVERAGED Fp(INCH/HR) = 0.98
                                                                                    LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Ap = 0.51
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 18.86 0.98 0.600 32
 EFFECTIVE STREAM AREA(ACRES) = 21.18
 TOTAL STREAM AREA(ACRES) = 21.18
                                                                                MOBILE HOME PARK A 19.95 0.98 0.250 32
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 30.34
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.420
 ** CONFLUENCE DATA **
                                                                                SUBAREA AREA (ACRES) = 38.81 SUBAREA RUNOFF (CFS) = 52.33
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                EFFECTIVE AREA(ACRES) = 109.72 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.46
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
           76.08 21.05 1.856 0.97(0.46) 0.47 60.6 20200.00
                                                                                TOTAL AREA (ACRES) = 120.6 PEAK FLOW RATE (CFS) = 143.97
           30.34 17.28 2.089 0.98(0.50) 0.51 21.2 20210.00
    2
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 ** PEAK FLOW RATE TABLE **
                                                                                DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 36.00
                                                                                FLOW VELOCITY (FEET/SEC.) = 7.27 DEPTH*VELOCITY (FT*FT/SEC.) = 5.62
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20215.00 = 4656.69 FEET.
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 103.24 17.28 2.089 0.98(0.47) 0.48 70.9 20210.00
                                                                              ******************
    2.
          101.97 21.05 1.856 0.97(0.47) 0.48 81.8 20200.00
                                                                                FLOW PROCESS FROM NODE 20215.00 TO NODE 20216.00 IS CODE = 63
                                                                               .....
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 103.24 Tc (MIN.) = 17.28
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 70.91 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                                >>>> (STREET TABLE SECTION # 13 USED) <<<<
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.48
                                                                              ______
 TOTAL AREA(ACRES) = 81.8
                                                                                UPSTREAM ELEVATION(FEET) = 1793.00 DOWNSTREAM ELEVATION(FEET) = 1740.00
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET.
                                                                                STREET LENGTH (FEET) = 1725.28 CURB HEIGHT (INCHES) = 8.0
                                                                                STREET HALFWIDTH (FEET) = 32.00
******************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20215.00 IS CODE = 63
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1793.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 1205.58 CURB HEIGHT (INCHES) = 8.0
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 32.00
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 171.80
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ***STREET FLOWING FULL***
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET FLOW DEPTH (FEET) = 0.84
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 40.44
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.97
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.82
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 4.13 Tc (MIN.) = 24.23
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.706
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.42
                                                                                SUBAREA LOSS RATE DATA (AMC II):
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 12

Date: 04/21/2014 File name: LR0202ZZ.RES Page 11

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL	MOBILE HOME PARK A 0.63 0.98 0.250 32
"3-4 DWELLINGS/ACRE" A 24.17 0.98 0.600 32	COMMERCIAL B 1.46 0.75 0.100 56
SCHOOL A 9.62 0.98 0.600 32	MOBILE HOME PARK B 4.91 0.75 0.250 56
MOBILE HOME PARK A 14.92 0.98 0.250 32	RESIDENTIAL
COMMERCIAL A 0.89 0.98 0.100 32	"3-4 DWELLINGS/ACRE" B 4.10 0.75 0.600 56
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
"3-4 DWELLINGS/ACRE" B 0.13 0.75 0.600 56	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.360
COMMERCIAL B 0.31 0.75 0.100 56	SUBAREA AREA(ACRES) = 11.10 SUBAREA RUNOFF(CFS) = 11.49
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97	EFFECTIVE AREA(ACRES) = 170.86 AREA-AVERAGED Fm(INCH/HR) = 0.44
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.484	AREA-AVERAGED Fp(INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.46
SUBAREA AREA (ACRES) = 50.04 SUBAREA RUNOFF (CFS) = 55.60	TOTAL AREA (ACRES) = 181.7 PEAK FLOW RATE (CFS) = 179.59
EFFECTIVE AREA (ACRES) = 159.76 AREA-AVERAGED Fm (INCH/HR) = 0.46	NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.47	Note: Thin their thin believed to obtain which
TOTAL AREA (ACRES) = 170.6 PEAK FLOW RATE (CFS) = 179.59	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
Total man (north)	5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	3M - 0.37, 30M - 0.73, 11M - 0.33, 31M - 1.72, 01M - 2.43, 24M - 3.33
50BAREA AREA-AVERAGED RAINFALL DEFIN(INCH).  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53	END OF SUBAREA STREET FLOW HYDRAULICS:
JM - 0.37, J0M - 0.73, INK - 0.33, JNK - 1.72, ONK - 2.43, Z4NK - 3.33	
END OF CUDADEA CODEED FLOW HADDAIN LOC.	DEPTH(FEET) = 1.42 HALFSTREET FLOOD WIDTH(FEET) = 69.55 FLOW VELOCITY(FEET/SEC.) = 2.02 DEPTH*VELOCITY(FT*FT/SEC.) = 2.87
END OF SUBAREA STREET FLOW HYDRAULICS:	FLOW VELOCITY (FEET/SEC.) = 2.02 DEPTH^VELOCITY (FT^FT/SEC.) = 2.87
DEPTH (FEET) = 0.84 HALFSTREET FLOOD WIDTH (FEET) = 40.87	ANAME FORTMAND APPROXIMATION PROMITE TO APPROXIMATE THAN
FLOW VELOCITY (FEET/SEC.) = 7.08 DEPTH*VELOCITY (FT*FT/SEC.) = 5.98	*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,	THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
AND L = 1725.3 FT WITH ELEVATION-DROP = 53.0 FT, IS 95.7 CFS,	SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20216.00	** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20216.00 = 6381.97 FEET.	ESTIMATED PIPE DIAMETER(INCH) = 69.00 NUMBER OF PIPES = 1
************	ASSUME FULL-FLOWING PIPELINE
	PIPE-FLOW VELOCITY(FEET/SEC.) = 4.14
FLOW PROCESS FROM NODE 20216.00 TO NODE 20232.00 IS CODE = 63	PIPE-FLOW(CFS) = 107.49
	PIPEFLOW TRAVEL TIME(MIN.) = 4.24 Tc(MIN.) = 28.47
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.548
>>>> (STREET TABLE SECTION # 13 USED) <<<<	SUBAREA AREA(ACRES) = 11.10 SUBAREA RUNOFF(CFS) = 12.75
	TOTAL AREA(ACRES) = 181.7 PEAK FLOW RATE(CFS) = 179.59
UPSTREAM ELEVATION(FEET) = 1740.00 DOWNSTREAM ELEVATION(FEET) = 1739.00	NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
STREET LENGTH(FEET) = 1052.00 CURB HEIGHT(INCHES) = 8.0	
STREET HALFWIDTH(FEET) = 32.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
	5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00	STREETFLOW HYDRAULICS BASED ON MAINLINE To :
INSIDE STREET CROSSFALL(DECIMAL) = 0.020	STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 72.11
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	***STREET FLOWING FULL***
	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	STREET FLOW DEPTH(FEET) = 1.06
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	HALFSTREET FLOOD WIDTH (FEET) = 51.67
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	AVERAGE FLOW VELOCITY(FEET/SEC.) = 1.59
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07	LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 185.34	*****************
***STREET FLOWING FULL***	FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	
STREET FLOW DEPTH(FEET) = 1.43	>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
HALFSTREET FLOOD WIDTH (FEET) = 70.28	
AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.04	TOTAL NUMBER OF STREAMS = 2
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.93	CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
STREET FLOW TRAVEL TIME (MIN.) = 8.59 Tc (MIN.) = 32.82	TIME OF CONCENTRATION (MIN.) = 28.47
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.422	RAINFALL INTENSITY (INCH/HR) = 1.55
SUBAREA LOSS RATE DATA (AMC II):	AREA-AVERAGED Fm (INCH/HR) = 0.44

Date: 04/21/2014 File name: LR0202ZZ.RES Page 13 Date: 04/21/2014 File name: LR0202ZZ.RES Page 14

```
AREA-AVERAGED Fp (INCH/HR) = 0.96
 AREA-AVERAGED Ap = 0.46
 EFFECTIVE STREAM AREA(ACRES) = 170.86
 TOTAL STREAM AREA(ACRES) = 181.70
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 179.59
*************************
 FLOW PROCESS FROM NODE 20220.00 TO NODE 20221.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 598.74
 ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1925.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.057
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.593
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                             Ap SCS Tc
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.11 0.98 0.600 32 12.06
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 9.23
 TOTAL AREA(ACRES) = 5.11 PEAK FLOW RATE(CFS) = 9.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
************************
 FLOW PROCESS FROM NODE 20221.00 TO NODE 20222.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1925.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1915.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 551.44
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.353
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.86
                                     0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.89
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.34
 AVERAGE FLOW DEPTH(FEET) = 0.53 FLOOD WIDTH(FEET) = 24.58
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 14.18
 SUBAREA AREA(ACRES) = 5.86 SUBAREA RUNOFF(CFS) = 9.32
 EFFECTIVE AREA(ACRES) = 10.97 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.56 FLOOD WIDTH (FEET) = 27.87
 FLOW VELOCITY (FEET/SEC.) = 4.43 DEPTH*VELOCITY (FT*FT/SEC) = 2.49
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20222.00 = 1150.18 FEET.
*****************
 FLOW PROCESS FROM NODE 20222.00 TO NODE 20223.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1915.00 DOWNSTREAM ELEVATION(FEET) = 1905.00
 STREET LENGTH (FEET) = 354.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  25.69
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 16.95
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 15.55
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.226
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 11.15 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 11.15 SUBAREA RUNOFF (CFS) = 16.47
 EFFECTIVE AREA(ACRES) = 22.12 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 22.1 PEAK FLOW RATE (CFS) =
                                                           32.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 4.61 DEPTH*VELOCITY (FT*FT/SEC.) = 2.29
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20223.00 = 1504.18 FEET.
```

TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) =

Date: 04/21/2014 File name: LR0202ZZ.RES Page 15

File name: LR020277.RFS

Date: 04/21/2014

Page 16

17.45

```
*******************
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20223.00 TO NODE 20224.00 IS CODE = 63
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1905.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 253.00 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.55
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 20.33
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.54
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.03
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 17.30
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                38.31
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.088
   ***STREET FLOWING FULL***
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
   STREET FLOW DEPTH(FEET) = 0.50
                                                                                     LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 MOBILE HOME PARK A 3.70 0.98 0.250
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.44
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" A 6.13 0.98 0.600
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.69
 STREET FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 16.33
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.162
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.468
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                 SUBAREA AREA(ACRES) = 9.83 SUBAREA RUNOFF(CFS) = 14.43
                                                                                 EFFECTIVE AREA(ACRES) = 39.36 AREA-AVERAGED Fm(INCH/HR) = 0.53
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
LE HOME PARK A 2.51 0.98 0.250 32
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.54
                                                                                 TOTAL AREA (ACRES) = 39.4 PEAK FLOW RATE (CFS) =
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.90 0.98 0.600 32
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481
 SUBAREA AREA(ACRES) = 7.41 SUBAREA RUNOFF(CFS) = 11.29
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 29.53 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                                 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.06
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.57
                                                                                 FLOW VELOCITY (FEET/SEC.) = 5.74 DEPTH*VELOCITY (FT*FT/SEC.) = 3.22
 TOTAL AREA (ACRES) = 29.5 PEAK FLOW RATE (CFS) = 42.68
                                                                                 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20225.00 = 2080.68 FEET.
                                                                                *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                  FLOW PROCESS FROM NODE 20225.00 TO NODE 20226.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.44
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 5.67 DEPTH*VELOCITY (FT*FT/SEC.) = 2.88
                                                                                ______
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20224.00 = 1757.18 FEET.
                                                                                 UPSTREAM ELEVATION(FEET) = 1885.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
                                                                                 STREET LENGTH (FEET) = 288.50 CURB HEIGHT (INCHES) = 6.0
******************
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20224.00 TO NODE 20225.00 IS CODE = 63
______
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1895.00 DOWNSTREAM ELEVATION(FEET) = 1885.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 323.50 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

Date: 04/21/2014

File name: LR0202ZZ.RES

Date: 04/21/2014 File name: LR0202ZZ.RES Page 18

49.89

SCS

55.15

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.53
 STREET FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 18.08
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.034
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.52
                                       0.98 0.600 32
 MOBILE HOME PARK A
                               6.40
                                       0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349
 SUBAREA AREA (ACRES) = 8.92 SUBAREA RUNOFF (CFS) = 13.59
 EFFECTIVE AREA(ACRES) = 48.28 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51
 TOTAL AREA(ACRES) = 48.3 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
 FLOW VELOCITY (FEET/SEC.) = 6.33 DEPTH*VELOCITY (FT*FT/SEC.) = 3.69
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20226.00 = 2369.18 FEET.
*******************
 FLOW PROCESS FROM NODE 20226.00 TO NODE 20227.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1875.00 DOWNSTREAM ELEVATION(FEET) = 1863.00
 STREET LENGTH (FEET) = 404.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
```

```
HALFSTREET FLOOD WIDTH (FEET) = 23.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.87
 STREET FLOW TRAVEL TIME (MIN.) = 1.08 Tc (MIN.) = 19.15
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.964
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                      A 9.70 0.98
                                                  0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.00 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.333
 SUBAREA AREA (ACRES) = 12.70 SUBAREA RUNOFF (CFS) = 18.74
 EFFECTIVE AREA (ACRES) = 60.98 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 61.0 PEAK FLOW RATE (CFS) =
                                                        82.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 24.66
 FLOW VELOCITY (FEET/SEC.) = 6.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.05
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 404.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 35.7 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20227.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20227.00 = 2773.68 FEET.
*****************
 FLOW PROCESS FROM NODE 20227.00 TO NODE 20228.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1863.00 DOWNSTREAM ELEVATION(FEET) = 1848.00
 STREET LENGTH (FEET) = 374.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.52
 STREET FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 20.01
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.913
```

Page 20

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 19

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
                                     Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AREA(ACRES) = 15.93 SUBAREA RUNOFF(CFS) = 18.42
 MOBILE HOME PARK A 4.46 0.98
PUBLIC PARK A 4.98 0.98
                                                0.250 32
                                                                                 EFFECTIVE AREA(ACRES) = 88.31 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
                                              0.850 32
                                                                                 TOTAL AREA (ACRES) = 88.3 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
                                                                                                                                     108.15
 "3-4 DWELLINGS/ACRE" A 1.96 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.572
                                                                                 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 SUBAREA AREA (ACRES) = 11.40 SUBAREA RUNOFF (CFS) = 13.90
 EFFECTIVE AREA(ACRES) = 72.38 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.49
                                                                                 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.46
 TOTAL AREA (ACRES) = 72.4 PEAK FLOW RATE (CFS) =
                                                                                 FLOW VELOCITY (FEET/SEC.) = 7.90 DEPTH*VELOCITY (FT*FT/SEC.) = 5.13
                                                                                 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20229.00 = 3658.71 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               ******************
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                 FLOW PROCESS FROM NODE 20229.00 TO NODE 20230.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.48
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 7.36 DEPTH*VELOCITY (FT*FT/SEC.) = 4.64
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20228.00 = 3148.18 FEET.
                                                                               ______
                                                                                 UPSTREAM ELEVATION(FEET) = 1826.00 DOWNSTREAM ELEVATION(FEET) = 1800.00
STREET LENGTH (FEET) = 713.66 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20228.00 TO NODE 20229.00 IS CODE = 63
                                                                                 STREET HALFWIDTH (FEET) = 18.00
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1848.00 DOWNSTREAM ELEVATION(FEET) = 1826.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 510.53 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREET FLOW DEPTH (FEET) = 0.69
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 27.47
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.73
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.64
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.27
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 22.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 102.85
   ***STREET FLOWING FULL***
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
   STREET FLOW DEPTH (FEET) = 0.64
                                                                                                                     Fρ
                                                                                                                                       SCS
   HALFSTREET FLOOD WIDTH (FEET) = 24.97
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                MOBILE HOME PARK A 11.14 0.98 0.250 32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.98
                                                                                                      A 6.85 0.98 0.850
                                                                                PUBLIC PARK
 STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 21.11
                                                                                 RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.853
                                                                                 "3-4 DWELLINGS/ACRE" A 3.99 0.98 0.600
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                       SCS
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.501
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AREA (ACRES) = 21.98 SUBAREA RUNOFF (CFS) = 25.47
     LAND USE
                                                                                 EFFECTIVE AREA(ACRES) = 110.29 AREA-AVERAGED Fm(INCH/HR) = 0.49
 MOBILE HOME PARK A 5.30
                                        0.98
                                               0.250 32
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 4.30
                                        0.98
                                                0.600 32
                                                                                 TOTAL AREA (ACRES) = 110.3 PEAK FLOW RATE (CFS) = 127.46
 PUBLIC PARK
                      A
                                6.33
                                        0.98
                                                0.850 32
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 21 Date: 04/21/2014 File name: LR0202ZZ.RES Page 22

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.59
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   FLOW VELOCITY (FEET/SEC.) = 7.96 DEPTH*VELOCITY (FT*FT/SEC.) = 5.98
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.02
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 FLOW VELOCITY (FEET/SEC.) = 7.75 DEPTH*VELOCITY (FT*FT/SEC.) = 5.43
                                                                                       AND L = 900.3 FT WITH ELEVATION-DROP = 31.0 FT, IS 66.2 CFS,
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20231.00
       AND L = 713.7 FT WITH ELEVATION-DROP = 26.0 FT, IS 51.4 CFS,
                                                                                   LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20231.00 = 5272.72 FEET.
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20230.00
                                                                                 *******************
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20230.00 = 4372.37 FEET.
                                                                                   FLOW PROCESS FROM NODE 20231.00 TO NODE 20232.00 IS CODE = 63
*******************
 FLOW PROCESS FROM NODE 20230.00 TO NODE 20231.00 IS CODE = 63
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 _____
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   UPSTREAM ELEVATION(FEET) = 1769.00 DOWNSTREAM ELEVATION(FEET) = 1739.00
_____
                                                                                   STREET LENGTH (FEET) = 905.39 CURB HEIGHT (INCHES) = 6.0
 UPSTREAM ELEVATION(FEET) = 1800.00 DOWNSTREAM ELEVATION(FEET) = 1769.00
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 STREET LENGTH (FEET) = 900.35 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.78
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 164.38
                                                                                    ***STREET FLOWING FULL***
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 145.29
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   ***STREET FLOWING FULL***
                                                                                    STREET FLOW DEPTH (FEET) = 0.77
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 31.56
   STREET FLOW DEPTH (FEET) = 0.74
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.96
   HALFSTREET FLOOD WIDTH (FEET) = 29.85
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.14
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.83
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.90 Tc (MIN.) = 26.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.77
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.617
 STREET FLOW TRAVEL TIME (MIN.) = 1.92 Tc(MIN.) = 24.58
                                                                                   SUBAREA LOSS RATE DATA(AMC II):
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.691
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                                                          SCS
                                                                                  MOBILE HOME PARK A 0.17 0.98 0.250

MOBILE HOME PARK B 5.75
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                           32
                                      Fp Ap SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                                                           56
 MOBILE HOME PARK A 14.01 0.98 MOBILE HOME PARK B 8.21 0.75
                                                 0.250 32
                                                                                   RESIDENTIAL
                                                 0.250 56
                                                                                   "3-4 DWELLINGS/ACRE" B 11.10 0.75 0.600 56
 RESIDENTIAL
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" A 2.69
                                         0.98
                                                 0.600 32
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.478
                                                                                   SUBAREA AREA (ACRES) = 17.02 SUBAREA RUNOFF (CFS) = 19.29
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.23 0.75 0.600 56
                                                                                   EFFECTIVE AREA(ACRES) = 155.45 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
                                                                                   TOTAL AREA (ACRES) = 155.4 PEAK FLOW RATE (CFS) = 164.84
 SUBAREA AREA (ACRES) = 28.14 SUBAREA RUNOFF (CFS) = 35.65
 EFFECTIVE AREA(ACRES) = 138.43 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.47
                                                                                   5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 TOTAL AREA (ACRES) = 138.4 PEAK FLOW RATE (CFS) = 154.74
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.56
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                   FLOW VELOCITY (FEET/SEC.) = 7.98 DEPTH*VELOCITY (FT*FT/SEC.) = 6.15
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 23 Date: 04/21/2014 File name: LR0202ZZ.RES Page 24

```
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
       AND L = 905.4 FT WITH ELEVATION-DROP = 30.0 FT, IS 38.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20232.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20232.00 = 6178.11 FEET.
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 350.49
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                   ***STREET FLOWING FULL***
_____
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TOTAL NUMBER OF STREAMS = 2
                                                                                   STREET FLOW DEPTH (FEET) = 1.45
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 71.26
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.75
 TIME OF CONCENTRATION (MIN.) = 26.48
 RAINFALL INTENSITY (INCH/HR) = 1.62
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.44
 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 5.67 Tc (MIN.) = 32.14
 AREA-AVERAGED Fp (INCH/HR) = 0.94
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.440
 AREA-AVERAGED Ap = 0.47
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 EFFECTIVE STREAM AREA(ACRES) = 155.45
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
 TOTAL STREAM AREA(ACRES) = 155.45
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 164.84
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" A 0.11 0.98
                                                                                                                                0.600
 ** CONFLUENCE DATA **
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 18.30 0.75 0.600
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
    1 179.59 28.47 1.548 0.96( 0.44) 0.46 170.9 20210.00
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                 SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 16.40
          169.53 32.46 1.431 0.96(0.45) 0.46 181.7 20200.00
    1
          164.84 26.48 1.617 0.94 (0.44) 0.47 155.4 20220.00
                                                                                 EFFECTIVE AREA(ACRES) = 332.73 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                 TOTAL AREA(ACRES) = 355.6 PEAK FLOW RATE(CFS) =
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 ** PEAK FLOW RATE TABLE **
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae
                                                       HEADWATER
                                                                                 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
           342.28 26.48 1.617 0.95(0.44) 0.46 314.3 20220.00
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
     2
          334.77 28.47 1.548 0.95(0.44) 0.46 326.3 20210.00
                                                                                 DEPTH(FEET) = 1.44 HALFSTREET FLOOD WIDTH(FEET) = 70.65
          308.34 32.46 1.431 0.95(0.44) 0.47 337.2 20200.00
                                                                                 FLOW VELOCITY (FEET/SEC.) = 3.73 DEPTH*VELOCITY (FT*FT/SEC.) = 5.37
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 PEAK FLOW RATE (CFS) = 342.28 Tc (MIN.) = 26.48
                                                                                       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 EFFECTIVE AREA(ACRES) = 314.32 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                                 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.46
                                                                                 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 TOTAL AREA (ACRES) = 337.2
                                                                                 ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
                                                                                 ASSUME FULL-FLOWING PIPELINE
                                                                                 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.36
******************
                                                                                 PIPE-FLOW(CFS) = 299.50
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20249.00 IS CODE = 63
                                                                                 PIPEFLOW TRAVEL TIME (MIN.) = 2.54 Tc (MIN.) = 29.02
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.531
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 17.92
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                 TOTAL AREA (ACRES) = 355.6
                                                                                                                  PEAK FLOW RATE (CFS) = 342.28
_____
                                                                                 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UPSTREAM ELEVATION(FEET) = 1739.00 DOWNSTREAM ELEVATION(FEET) = 1735.00
 STREET LENGTH (FEET) = 1274.82 CURB HEIGHT (INCHES) = 8.0
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET HALFWIDTH (FEET) = 32.00
                                                                                 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 42.79
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014

File name: LR020277.RFS

Date: 04/21/2014 File name: LR0202ZZ.RES Page 26

SCS

32

```
STREET FLOW DEPTH (FEET) = 0.78
  HALFSTREET FLOOD WIDTH (FEET) = 37.09
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.08
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.63
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.
******************
 FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
_____
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 29.02
 RAINFALL INTENSITY (INCH/HR) = 1.53
 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 332.73
 TOTAL STREAM AREA(ACRES) = 355.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 342.28
*******************
 FLOW PROCESS FROM NODE 20240.00 TO NODE 20241.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 916.98
 ELEVATION DATA: UPSTREAM(FEET) = 1880.00 DOWNSTREAM(FEET) = 1855.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.964
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.483
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS Tc
                                           αp
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                            4.79
                                    0.98
                                           0.600
                                                 32 12.96
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  в 3.77
                                    0.75
                                           0.600 56 12.96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 15.08
                 8.56 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20241.00 TO NODE 20242.00 IS CODE = 92
._____
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1855.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1848.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 207.39
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
```

```
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.418
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 1.59
                                        0.98
                                                0.600
                                                        32
 RESIDENTIAL
                    B 2.06 0.75
 "3-4 DWELLINGS/ACRE"
                                                0.600
                                                        56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.91
 AVERAGE FLOW DEPTH(FEET) = 0.53 FLOOD WIDTH(FEET) = 23.98
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 13.55
 SUBAREA AREA(ACRES) = 3.65
                               SUBAREA RUNOFF (CFS) = 6.27
 EFFECTIVE AREA(ACRES) = 12.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 12.2
                               PEAK FLOW RATE(CFS) =
                                                          20.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.54 FLOOD WIDTH(FEET) = 25.93
 FLOW VELOCITY (FEET/SEC.) = 5.97 DEPTH*VELOCITY (FT*FT/SEC) = 3.25
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20242.00 = 1124.37 FEET.
******************
 FLOW PROCESS FROM NODE 20242.00 TO NODE 20243.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
 UPSTREAM NODE ELEVATION (FEET) = 1848.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1840.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 276.91
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.334
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                       Fр
                                                Aр
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 2.48
                                        0.98
                                                0.600
                                                        32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        B
                               3.59
                                        0.75
                                                0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.59
                                        0.75
                                                0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.66
 AVERAGE FLOW DEPTH(FEET) = 0.59 FLOOD WIDTH(FEET) = 30.71
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 14.36
```

File name: LR020277.RFS

Page 28

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 27

```
SUBAREA AREA(ACRES) = 6.66
                                SUBAREA RUNOFF(CFS) = 10.88
                                                                                  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 EFFECTIVE AREA(ACRES) = 18.87 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.61
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA(ACRES) = 18.9
                                 PEAK FLOW RATE (CFS) = 30.82
                                                                                  DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 19.70
                                                                                  FLOW VELOCITY (FEET/SEC.) = 5.23 DEPTH*VELOCITY (FT*FT/SEC.) = 2.89
                                                                                  LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20244.00 = 1694.78 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                  FLOW PROCESS FROM NODE 20244.00 TO NODE 20245.00 IS CODE = 63
                                                                                ______
 DEPTH(FEET) = 0.61 FLOOD WIDTH(FEET) = 33.24
 FLOW VELOCITY(FEET/SEC.) = 5.78 DEPTH*VELOCITY(FT*FT/SEC) = 3.51
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20243.00 = 1401.28 FEET.
                                                                                  >>>> (STREET TABLE SECTION # 18 USED) <<<<
*****************
                                                                                  UPSTREAM ELEVATION(FEET) = 1830.00 DOWNSTREAM ELEVATION(FEET) = 1815.00
 FLOW PROCESS FROM NODE 20243.00 TO NODE 20244.00 IS CODE = 63
                                                                                  STREET LENGTH (FEET) = 273.00 CURB HEIGHT (INCHES) = 8.0
______
                                                                                  STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1830.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 293.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    48.34
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH(FEET) = 0.54
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 18.88
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.44
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.45
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 16.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.185
   STREET FLOW DEPTH(FEET) = 0.53
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
   HALFSTREET FLOOD WIDTH (FEET) = 18.71
                                                                                                                         Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.08
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.70
                                                                                  RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 15.33
                                                                                  "3-4 DWELLINGS/ACRE" A 2.55
                                                                                                                          0.98
                                                                                                                                  0.600
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.245
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 4.04
                                                                                                                          0.75
                                                                                                                                 0.600
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Αp
                                                        SCS
                                                                                  RESIDENTIAL
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  ".4 DWELLING/ACRE"
                                                                                                       В 1.15
                                                                                                                          0.75 0.900
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 "3-4 DWELLINGS/ACRE" A 3.29
                                         0.98
                                                 0.600 32
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645
 RESIDENTIAL
                                                                                  SUBAREA AREA (ACRES) = 7.74 SUBAREA RUNOFF (CFS) = 11.55
                                                       56
                                                                                  EFFECTIVE AREA(ACRES) = 35.20 AREA-AVERAGED Fm(INCH/HR) = 0.52
 "3-4 DWELLINGS/ACRE"
                     B 4.18
                                         0.75
                                                 0.600
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.62
 RESIDENTIAL
                                                                                  TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) = 52.63
 ".4 DWELLING/ACRE"
                       B
                              1.12
                                         0.75
                                                 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.639
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 8.59 SUBAREA RUNOFF (CFS) = 13.26
                                                                                  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 EFFECTIVE AREA(ACRES) = 27.46 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.62
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 27.5 PEAK FLOW RATE (CFS) =
                                                                                  DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 19.53
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.58 DEPTH*VELOCITY (FT*FT/SEC.) = 3.61
                                                                                  LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20245.00 = 1967.78 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 Date: 04/21/2014 File name: LR0202ZZ.RES Page 29 File name: LR0202ZZ.RES Page 30

32

56

```
*******************
 FLOW PROCESS FROM NODE 20245.00 TO NODE 20246.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1815.00 DOWNSTREAM ELEVATION(FEET) = 1805.00
 STREET LENGTH (FEET) = 359.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.30
 STREET FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 17.17
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.097
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.90
                                           0.98
                                                   0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В 5.36
                                           0.75
                                                   0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       В 0.93
                                          0.75
                                                   0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627
 SUBAREA AREA(ACRES) = 10.19 SUBAREA RUNOFF(CFS) = 14.45
 EFFECTIVE AREA(ACRES) = 45.39 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 45.4 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.10
 FLOW VELOCITY (FEET/SEC.) = 5.36 DEPTH*VELOCITY (FT*FT/SEC.) = 3.43
```

LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20246.00 = 2326.78 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

File name: LR020277.RFS

Page 31

FLOW PROCESS FROM NODE 20246.00 TO NODE 20247.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 18 USED) <<<<

Date: 04/21/2014

UPSTREAM ELEVATION(FEET) = 1805.00 DOWNSTREAM ELEVATION(FEET) = 1795.00 STREET LENGTH (FEET) = 324.04 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 70.07 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.65HALFSTREET FLOOD WIDTH (FEET) = 24.45 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.68 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.68 STREET FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 18.12 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.031 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" A 3.02 0.98 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.88 0.75 RESIDENTIAL B 0.55 0.75 0.900 ".4 DWELLING/ACRE" SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620 SUBAREA AREA (ACRES) = 8.45 SUBAREA RUNOFF (CFS) = 11.55 EFFECTIVE AREA(ACRES) = 53.84 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.62 TOTAL AREA (ACRES) = 53.8 PEAK FLOW RATE (CFS) = 73.12SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53

SCS

32

56

0.600

0.600

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 24.86 FLOW VELOCITY (FEET/SEC.) = 5.74 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.76 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20247.00 = 2650.82 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20247.00 TO NODE 20248.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1795.00 DOWNSTREAM ELEVATION(FEET) = 1782.00 STREET LENGTH (FEET) = 263.00 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00

Date: 04/21/2014 File name: LR0202ZZ.RES Page 32

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    94.07
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH (FEET) = 0.70
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 27.89
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.13
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.32
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 4.32 Tc (MIN.) = 23.07
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.757
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.28
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.96
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                        SCS
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.34
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 18.75
                                                                                 RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.989
                                                                                 "3-4 DWELLINGS/ACRE" A 0.28
                                                                                                                         0.98
                                                                                                                                 0.600
                                                                                                                                         32
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                 "3-4 DWELLINGS/ACRE" B 21.09
                                                                                                                         0.75
                                                                                                                                 0.600
                                                                                                                                         56
                                                 αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 ".4 DWELLING/ACRE" B 0.85
                                                                                                                         0.75 0.900
 "3-4 DWELLINGS/ACRE"
                    A
                              1.94
                                         0.98
                                                 0.600
                                                       32
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.611
 RESIDENTIAL
                                                                                 SUBAREA AREA(ACRES) = 22.22 SUBAREA RUNOFF(CFS) = 25.95
                        B 5.00
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                0.600
                                                        56
 RESIDENTIAL
                                                                                 EFFECTIVE AREA(ACRES) = 83.49 AREA-AVERAGED Fm(INCH/HR) = 0.50
 ".4 DWELLING/ACRE"
                              0.49
                                        0.75
                                                0.900 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.62
                      В
                                                                                 TOTAL AREA (ACRES) = 83.5 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81
                                                                                                                                          94.21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA(ACRES) = 7.43 SUBAREA RUNOFF(CFS) = 9.96
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 61.27 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 61.3 PEAK FLOW RATE (CFS) =
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.89
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.14 DEPTH*VELOCITY (FT*FT/SEC.) = 4.33
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                                 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20249.00 = 4503.33 FEET.
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.63
                                                                                 FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
 FLOW VELOCITY (FEET/SEC.) = 7.02 DEPTH*VELOCITY (FT*FT/SEC.) = 4.43
                                                                                _______
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20248.00 = 2913.82 FEET.
                                                                                 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
******************
                                                                                ______
 FLOW PROCESS FROM NODE 20248.00 TO NODE 20249.00 IS CODE = 63
                                                                                 TOTAL NUMBER OF STREAMS = 2
                                                                                 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                 TIME OF CONCENTRATION (MIN.) = 23.07
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 RAINFALL INTENSITY (INCH/HR) = 1.76
_____
                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.50
 UPSTREAM ELEVATION(FEET) = 1782.00 DOWNSTREAM ELEVATION(FEET) = 1735.00
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.81
 STREET LENGTH (FEET) = 1589.51 CURB HEIGHT (INCHES) = 8.0
                                                                                 AREA-AVERAGED Ap = 0.62
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 EFFECTIVE STREAM AREA(ACRES) = 83.49
                                                                                 TOTAL STREAM AREA(ACRES) = 83.49
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 PEAK FLOW RATE (CFS) AT CONFLUENCE = 94.21
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ** CONFLUENCE DATA **
                                                                                  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                                                                                                        HEADWATER
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  NUMBER
                                                                                            (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                (ACRES) NODE
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   1
                                                                                           342.28 29.02 1.531 0.94(0.44) 0.47 332.7 20220.00
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                           334.77 31.08 1.469 0.94(0.44) 0.47
                                                                                                                                  344.7 20210.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 33 Date: 04/21/2014 File name: LR0202ZZ.RES

Page 34

1 308.34 35.13 1.365 0.94(0.44) 0.47 355.6 20200.00 2 94.21 23.07 1.757 0.81(0.50) 0.62 83.5 20240.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.  ** PEAK FLOW RATE TABLE **	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.726 SUBAREA AREA(ACRES) = 1.00 SUBAREA RUNOFF(CFS) = 1.04 EFFECTIVE AREA(ACRES) = 349.03 AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.51 TOTAL AREA(ACRES) = 440.1 PEAK FLOW RATE(CFS) = 422.80 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
STREAM         Q         Tc         Intensity         Fp(Fm)         Ap         Ae         HEADWATER           NUMBER         (CFS)         (MIN.)         (INCH/HR)         (INCH/HR)         (ACRES)         NODE           1         422.80         23.07         1.757         0.90 (0.46)         0.51         348.0         20240.00           2         419.52         29.02         1.531         0.91 (0.45)         0.50         416.2         20220.00           3         407.37         31.08         1.469         0.91 (0.45)         0.50         428.2         20210.00           4         373.10         35.13         1.365         0.91 (0.45)         0.50         439.1         20200.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 1.43 HALFSTREET FLOOD WIDTH(FEET) = 69.92  FLOW VELOCITY(FEET/SEC.) = 4.71 DEPTH*VELOCITY(FT*FT/SEC.) = 6.71
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE(CFS) = 422.80 Tc(MIN.) = 23.07  EFFECTIVE AREA(ACRES) = 348.03 AREA-AVERAGED Fm(INCH/HR) = 0.46  AREA-AVERAGED Fp(INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.51  TOTAL AREA(ACRES) = 439.1  LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.  **********************************	*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN  THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07  SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **  ESTIMATED PIPE DIAMETER(INCH) = 75.00 NUMBER OF PIPES = 1  ASSUME FULL-FLOWING PIPELINE  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.13  PIPE-FLOW(CFS) = 311.16  PIPEFLOW TRAVEL TIME(MIN.) = 0.64 TC(MIN.) = 23.71
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.728 SUBAREA AREA (ACRES) = 1.00 SUBAREA RUNOFF (CFS) = 1.07 TOTAL AREA (ACRES) = 440.1 PEAK FLOW RATE (CFS) = 422.80 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
UPSTREAM ELEVATION (FEET) = 1735.00 DOWNSTREAM ELEVATION (FEET) = 1733.00 STREET LENGTH (FEET) = 391.69 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc:
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALESTREETS CARRYING PUNCES = 2	STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 111.64  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH (FEET) = 0.94  UNICORPORATE FLOOD WIDTH (FEET) = 45.87
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07	HALFSTREET FLOOD WIDTH(FEET) = 45.87  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.28  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.10  LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20250.00 = 9100.48 FEET.
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 423.32 ***STREET FLOWING FULL***	FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 10
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 1.43  HALFSTREET FLOOD WIDTH(FEET) = 69.92	>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.72 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.72 STREET FLOW TRAVEL TIME(MIN.) = 1.38 Tc(MIN.) = 24.45 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.696	**************************************
SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 0.58 0.75 0.600 56  RESIDENTIAL  ".4 DWELLING/ACRE" B 0.42 0.75 0.900 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75	PEAK FLOWRATE TABLE FILE NAME: 20151.DNA MEMORY BANK # 2 DEFINED AS FOLLOWS: PEAK FLOW RATE(CFS) = 1238.39 Tc(MIN.) = 38.75 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.59 TOTAL AREA(ACRES) = 1725.0 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.

Date: 04/21/2014

File name: LR0202ZZ.RES

Date: 04/21/2014 File name: LR0202ZZ.RES Page 36

```
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1238.39 Tc (MIN.) = 38.75
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.59
 TOTAL AREA (ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
*****
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<<
______
FLOW PROCESS FROM NODE 20151.00 TO NODE 20250.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1785.00 DOWNSTREAM(FEET) = 1733.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1656.68 CHANNEL SLOPE = 0.0314
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1238.39
 FLOW VELOCITY (FEET/SEC.) = 27.59 FLOW DEPTH (FEET) = 2.86
 TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 39.75
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
*****************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 39.75
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.267
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                        Ap SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                               56
 "3-4 DWELLINGS/ACRE" B 1.58
                                   0.75
                                          0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   B 54.48
                                   0.75
                                         0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892
 SUBAREA AREA (ACRES) = 56.06
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.78;1H= 1.03;3H= 1.90;6H= 2.82;24H= 6.10
 S-GRAPH: VALLEY(DEV.) = 23.5%; VALLEY(UNDEV.) / DESERT= 76.5%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.61; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
```

```
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1781.1
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0454; Lca/L=0.4,n=.0407; Lca/L=0.5,n=.0374; Lca/L=0.6,n=.0349
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 391.37
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1232.27
 TOTAL AREA (ACRES) = 1781.1
                              PEAK FLOW RATE (CFS) = 1238.39
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*********************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 2050.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1238.39 Tc (MIN.) = 39.75
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.59
 TOTAL AREA(ACRES) = 1781.1
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
          Q Tc Intensity Fp(Fm)
                                        Ap Ae HEADWATER
                                               (ACRES) NODE
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
  1
          422.80 23.71 1.728 0.90(0.46) 0.51
                                                349.0 20240.00
          419.52 29.66 1.511 0.90(0.45)0.50
                                                417.2 20220.00
    2.
          407.37 31.72
                        1.451 0.91(0.45)0.50
                                                429.2 20210.00
          373.10 35.78
                        1.350 0.91(0.45)0.50
                                               440.1 20200.00
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 2050.00 = 9100.48 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.87;6H= 2.74;24H= 5.99
 S-GRAPH: VALLEY (DEV.) = 38.4%; VALLEY (UNDEV.) / DESERT= 61.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2221.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0454; Lca/L=0.4,n=.0407; Lca/L=0.5,n=.0374; Lca/L=0.6,n=.0349
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 498.50
 PEAK FLOW RATE (CFS) = 1535.91
*****************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20274.00 IS CODE = 54
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 37 Date: 04/21/2014

Page 38

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                           PEAK FLOW RATE (CFS) = 1543.19 Tc (MIN.) = 41.19
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.57
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1733.00 DOWNSTREAM(FEET) = 1670.00
                                                                           TOTAL AREA (ACRES) =
                                                                                            2259.8
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2379.03 CHANNEL SLOPE = 0.0265
                                                                         CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
                                                                           FLOW PROCESS FROM NODE 20260.00 TO NODE 20261.00 IS CODE = 21
 CHANNEL FLOW THRU SUBAREA(CFS) = 1535.91
                                                                         ______
 FLOW VELOCITY (FEET/SEC.) = 27.58 FLOW DEPTH (FEET) = 3.34
                                                                           >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 41.19
                                                                          >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
                                                                         _____
                                                                           INITIAL SUBAREA FLOW-LENGTH (FEET) = 680.83
*****
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2360.00
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 81
                                                                           Tc = K^*[(LENGTH^** 3.00)/(ELEVATION CHANGE)]^**0.20
                                                                           SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.333
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                           * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.494
                                                                           SUBAREA TC AND LOSS RATE DATA (AMC II):
 MAINLINE Tc (MIN.) = 41.19
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.241
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              LAND USE
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Дp
                                                   SCS
                                                                           NATURAL FAIR COVER
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           "OPEN BRUSH"
                                                                                              в 4.43
                                                                                                               0.61 1.000
 RESIDENTIAL
                                                                           RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.23
                                     0.75
                                            0.600
                                                  56
                                                                           "2 DWELLINGS/ACRE"
                                                                                              B 2.14
                                                                                                               0.75 0.700 56
 RESIDENTIAL
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 "3-4 DWELLINGS/ACRE" A 0.07
                                     0.98
                                             0.600
                                                    32
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
                                                                           SUBAREA RUNOFF(CFS) = 17.21
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                             9.49
                                     0.75
                                             0.900
                                                  56
                                                                           TOTAL AREA (ACRES) = 6.57 PEAK FLOW RATE (CFS) = 17.21
                                                  56
 SCHOOL
                      В
                             24.91
                                     0.75
                                             0.600
 SCHOOL
                      Α
                             0.90
                                     0.98
                                            0.600
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                                                                         *******************
 SUBAREA AREA(ACRES) = 38.60
                                                                           FLOW PROCESS FROM NODE 20261.00 TO NODE 20262.00 IS CODE = 54
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.87;6H= 2.74;24H= 5.98
 S-GRAPH: VALLEY(DEV.) = 39.0%; VALLEY(UNDEV.) / DESERT = 61.0%
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.58; Ybar = 0.57
                                                                         ______
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 2360.00 DOWNSTREAM(FEET) = 2280.00
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 583.76 CHANNEL SLOPE = 0.1370
 3HR = 0.98; 6HR = 0.99; 24HR = 1.00
                                                                           CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2259.8
                                                                           MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
                                                                           CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                       17.21
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                           FLOW VELOCITY (FEET/SEC.) = 3.58 FLOW DEPTH (FEET) = 0.31
                                                                           TRAVEL TIME (MIN.) = 2.72 Tc (MIN.) = 10.05
  Lca/L=0.3, n=.0419; Lca/L=0.4, n=.0375; Lca/L=0.5, n=.0345; Lca/L=0.6, n=.0322
                                                                           LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20262.00 = 1264.59 FEET.
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 507.17
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1543.19
                                                                         ******************
 TOTAL AREA (ACRES) = 2259.8 PEAK FLOW RATE (CFS) = 1543.19
                                                                           FLOW PROCESS FROM NODE 20262.00 TO NODE 20262.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         _____
*****************
                                                                           MAINLINE Tc(MIN.) = 10.05
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
                                                                           * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.892
                                                                           SUBAREA LOSS RATE DATA(AMC II):
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fp
_____
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TOTAL NUMBER OF STREAMS = 2
                                                                           RESIDENTIAL
```

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

Date: 04/21/2014 File name: LR0202ZZ.RES

Date: 04/21/2014 File name: LR020277.RFS Page 40

SCS Tc

66 11.82

7.33

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

```
"2 DWELLINGS/ACRE"
                   B 4.44 0.75 0.700 56
 NATURAL FAIR COVER
                           15.90 0.61 1.000 66
 "OPEN BRUSH"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.935
 SUBAREA AREA(ACRES) = 20.34
                           SUBAREA RUNOFF (CFS) = 42.07
 EFFECTIVE AREA(ACRES) = 26.91 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.93
 TOTAL AREA (ACRES) = 26.9 PEAK FLOW RATE (CFS) =
                                                  55.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20262.00 TO NODE 20263.00 IS CODE = 54
...........
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2170.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 994.37 CHANNEL SLOPE = 0.1106
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             55.72
 FLOW VELOCITY (FEET/SEC.) = 4.35 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 3.81 Tc (MIN.) = 13.86
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20263.00 = 2258.96 FEET.
******************
 FLOW PROCESS FROM NODE 20263.00 TO NODE 20263.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 13.86
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.385
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
     LAND USE
             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                          8.82
                                    0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 8.82 SUBAREA RUNOFF(CFS) = 14.77
 EFFECTIVE AREA(ACRES) = 35.73 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 35.7 PEAK FLOW RATE (CFS) =
                                                  58.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20263.00 TO NODE 20264.00 IS CODE = 54
...........
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2110.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 784.49 CHANNEL SLOPE = 0.0765
```

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            58.19
 FLOW VELOCITY (FEET/SEC.) = 3.90 FLOW DEPTH (FEET) = 0.55
 TRAVEL TIME (MIN.) = 3.35 Tc (MIN.) = 17.22
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20264.00 = 3043.45 FEET.
*******************
 FLOW PROCESS FROM NODE 20264.00 TO NODE 20264.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 17.22
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.094
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Aр
                                                 SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 17.48
                                   0.75
                                          0.700
                                                 56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     в 7.48
                                   0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.790
 SUBAREA AREA(ACRES) = 24.96
                         SUBAREA RUNOFF (CFS) = 34.67
 EFFECTIVE AREA(ACRES) = 60.69 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 TOTAL AREA(ACRES) = 60.7 PEAK FLOW RATE(CFS) =
                                                 83.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
********************
 FLOW PROCESS FROM NODE 20264.00 TO NODE 20265.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2080.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.96 CHANNEL SLOPE = 0.0454
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 83.51
 FLOW VELOCITY (FEET/SEC.) = 3.49 FLOW DEPTH (FEET) = 0.69
 TRAVEL TIME (MIN.) = 3.15 Tc (MIN.) = 20.37
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20265.00 = 3704.41 FEET.
******************
 FLOW PROCESS FROM NODE 20265.00 TO NODE 20265.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 20.37
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.893
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                           αA
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                            6.85
                                   0.75
                                          0.700
      Date: 04/21/2014 File name: LR0202ZZ.RES
                                                Page 42
```

Date: 04/21/2014 File name: LR020277.RFS Page 41

```
RESIDENTIAL.
 ".4 DWELLING/ACRE"
                             0.71
                                     0.75
                                            0.900
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                            59.45 0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968
 SUBAREA AREA (ACRES) = 67.01
                             SUBAREA RUNOFF (CFS) = 77.65
 EFFECTIVE AREA(ACRES) = 127.70 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.91
 TOTAL AREA (ACRES) = 127.7
                            PEAK FLOW RATE(CFS) =
                                                 150.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*******************
 FLOW PROCESS FROM NODE 20265.00 TO NODE 20266.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2010.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 947.22 CHANNEL SLOPE = 0.0739
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             150.18
 FLOW VELOCITY (FEET/SEC.) = 4.83 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 3.27 Tc (MIN.) = 23.64
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20266.00 = 4651.63 FEET.
FLOW PROCESS FROM NODE 20266.00 TO NODE 20266.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 23.64
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.731
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                   SCS
                                             αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 10.89
                                     0.75
                                            0.700
                                                  56
 RESIDENTIAL
                     В 11.99
                                            0.900
 ".4 DWELLING/ACRE"
                                     0.75
                                                   56
 NATURAL FAIR COVER
                           4.30
 "OPEN BRUSH"
                      В
                                     0.61
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836
 SUBAREA AREA(ACRES) = 27.18
                          SUBAREA RUNOFF (CFS) = 27.58
 EFFECTIVE AREA(ACRES) = 154.88 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) = 154.9
                             PEAK FLOW RATE (CFS) = 159.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*****************
 FLOW PROCESS FROM NODE 20266.00 TO NODE 20267.00 IS CODE = 54
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2010.00 DOWNSTREAM(FEET) = 1960.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 906.98 CHANNEL SLOPE = 0.0551
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 4.39 FLOW DEPTH (FEET) = 0.85
 TRAVEL TIME (MIN.) = 3.44 Tc (MIN.) = 27.08
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20267.00 = 5558.61 FEET.
******************
 FLOW PROCESS FROM NODE 20267.00 TO NODE 20267.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 27.08
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.596
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS
                                           Αp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 53.81
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   B 46.51
                                    0.75
                                           0.900
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                            68.77
                                    0.61 1.000
                                                  66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.877
 SUBAREA AREA(ACRES) = 169.09
                           SUBAREA RUNOFF (CFS) = 151.27
 EFFECTIVE AREA(ACRES) = 323.97 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) = 324.0
                             PEAK FLOW RATE(CFS) =
                                                 291.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*************************
 FLOW PROCESS FROM NODE 20267.00 TO NODE 20268.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1268.00 CHANNEL SLOPE = 0.0552
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             291.52
 FLOW VELOCITY (FEET/SEC.) = 10.15 FLOW DEPTH (FEET) = 2.04
 TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 29.17
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20268.00 = 6826.61 FEET.
*****************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20268.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 43 Date: 04/21/2014 File name: LR0202ZZ.RES Page 44

```
MAINLINE Tc(MIN.) = 29.17
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.526
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           qΑ
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 30.11
                                     0.75
                                            0.900
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.46
                                     0.75
                                            0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
                            SUBAREA RUNOFF (CFS) = 23.53
 SUBAREA AREA(ACRES) = 30.57
 EFFECTIVE AREA(ACRES) = 354.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.89
 TOTAL AREA(ACRES) = 354.5
                           PEAK FLOW RATE(CFS) =
                                                   294.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20269.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1870.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 379.58 CHANNEL SLOPE = 0.0527
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              294.83
 FLOW VELOCITY (FEET/SEC.) = 10.02 FLOW DEPTH (FEET) = 2.08
 TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 29.80
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20269.00 = 7206.19 FEET.
*******************
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20269.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 29.80
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.507
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                             Αp
                                                   SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 17.99
                                     0.75
                                             0.900
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           0.04
                                     0.75
                                            0.600
                                                  56
                      В
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            18.04
                                     0.61
                                            1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 16.31
                                            0.700
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872
 SUBAREA AREA(ACRES) = 52.38 SUBAREA RUNOFF(CFS) = 42.46
 EFFECTIVE AREA(ACRES) = 406.92 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 406.9 PEAK FLOW RATE (CFS) = 331.07
```

```
5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
*****************
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20270.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1770.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2346.89 CHANNEL SLOPE = 0.0426
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             331.07
 FLOW VELOCITY (FEET/SEC.) = 9.64 FLOW DEPTH (FEET) = 2.34
 TRAVEL TIME (MIN.) = 4.06 Tc (MIN.) = 33.85
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20270.00 = 9553.08 FEET.
******************
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20270.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 33.85
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.396
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.45
                                    0.75
                                           0.600
                                                  56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 71.00
                                    0.75
                                           0.900
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           5.28
                                    0.61
                                          1.000
                                                  66
 RESIDENTIAL
                                    0.75 0.700
 "2 DWELLINGS/ACRE"
                    В
                           40.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.825
 SUBAREA AREA(ACRES) = 122.07
                          SUBAREA RUNOFF(CFS) = 86.18
 EFFECTIVE AREA(ACRES) = 528.99 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 529.0 PEAK FLOW RATE (CFS) = 376.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20271.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1755.00
 STREET LENGTH (FEET) = 692.85 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
```

Page 46

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 45

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 427.45
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.13
 HALFSTREET FLOOD WIDTH (FEET) = 55.27
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.06
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 9.12
STREET FLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 35.29
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.361
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                         Fρ
                                                          SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
".4 DWELLING/ACRE"
                      В 100.00
                                          0.75
                                                   0.900
                                                         56
RESIDENTIAL
".4 DWELLING/ACRE"
                      В 27.18
                                          0.75
                                                   0.900
                                                           56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 11.00
                                          0.75
                                                   0.600
                                                           56
RESIDENTIAL
"2 DWELLINGS/ACRE"
                         B 18.36
                                          0.75
                                                   0.700
                                                          56
NATURAL FAIR COVER
                         B
"OPEN BRUSH"
                               0.17
                                          0.61
                                                 1.000
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856
SUBAREA AREA(ACRES) = 156.71
                             SUBAREA RUNOFF(CFS) = 101.75
EFFECTIVE AREA(ACRES) = 685.70 AREA-AVERAGED Fm(INCH/HR) = 0.61
AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.87
TOTAL AREA (ACRES) = 685.7 PEAK FLOW RATE (CFS) =
                                                         461.99
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.16 HALFSTREET FLOOD WIDTH(FEET) = 56.61
FLOW VELOCITY (FEET/SEC.) = 8.24 DEPTH*VELOCITY (FT*FT/SEC.) = 9.55
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 17.38
PIPE-FLOW(CFS) = 308.18
PIPEFLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 34.52
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.379
SUBAREA AREA(ACRES) = 156.71 SUBAREA RUNOFF(CFS) = 104.31
TOTAL AREA (ACRES) = 685.7 PEAK FLOW RATE (CFS) = 473.17
```

```
5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 164.99
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 41.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.28
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 692.8 FT WITH ELEVATION-DROP = 15.0 FT, IS 274.0 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20271.00
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
******************
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20271.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
_____
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
 S-GRAPH: VALLEY(DEV.) = 28.6%; VALLEY(UNDEV.) / DESERT= 71.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.61; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 685.7
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0581; Lca/L=0.4,n=.0521; Lca/L=0.5,n=.0478; Lca/L=0.6,n=.0446
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 128.46
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 518.91
 TOTAL PEAK FLOW RATE (CFS) = 518.91 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 473.17
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 473.17)
 PEAK FLOW RATE(CFS) USED = 518.91
*****************
 FLOW PROCESS FROM NODE 20271.00 TO NODE 20272.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1755.00 DOWNSTREAM ELEVATION(FEET) = 1730.00
 STREET LENGTH (FEET) = 1359.40 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

Page 48

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 47

```
DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
                                              783.6
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20272.00 = 11605.33 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0519; Lca/L=0.4, n=.0465; Lca/L=0.5, n=.0427; Lca/L=0.6, n=.0399
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 144.58
 TOTAL AREA (ACRES) = 783.6
                                 PEAK FLOW RATE (CFS) = 572.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 201.78
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.93
   HALFSTREET FLOOD WIDTH (FEET) = 45.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.15
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.72
******************
  FLOW PROCESS FROM NODE 20272.00 TO NODE 20273.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1730.00 DOWNSTREAM ELEVATION (FEET) = 1695.00
 STREET LENGTH (FEET) = 1247.53 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 588.77
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.22
   HALFSTREET FLOOD WIDTH (FEET) = 54.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.16
 STREET FLOW TRAVEL TIME (MIN.) = 2.09 Tc (MIN.) = 37.93
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.304
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.91 0.75 0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 52.68 0.75 0.900
                                                          56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884
```

Page 50

Date: 04/21/2014

Date: 04/21/2014 File name: LR0202ZZ.RES Page 49

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

```
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT = 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.63; LAG(HR) = 0.51; Fm(INCH/HR) = 0.62; Ybar = 0.64
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 839.2
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20273.00 = 11605.33 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0574; Lca/L=0.4,n=.0515; Lca/L=0.5,n=.0473; Lca/L=0.6,n=.0441
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 153.70
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 587.18
TOTAL AREA (ACRES) = 839.2 PEAK FLOW RATE (CFS) =
                                                              587.18
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.22 HALFSTREET FLOOD WIDTH(FEET) = 53.96
FLOW VELOCITY (FEET/SEC.) = 9.96 DEPTH*VELOCITY (FT*FT/SEC.) = 12.14
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 21.15
PIPE-FLOW(CFS) = 458.15
PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 36.83
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.62; Ybar = 0.64
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20273.00 = 12852.86 FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0493; Lca/L=0.4,n=.0442; Lca/L=0.5,n=.0406; Lca/L=0.6,n=.0379
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 153.70
TOTAL AREA (ACRES) = 839.2 PEAK FLOW RATE (CFS) = 598.55
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 140.40
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 0.75
  HALFSTREET FLOOD WIDTH (FEET) = 30.65
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.19
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.42
```

```
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1695.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 797.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     599.49
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.20
   HALFSTREET FLOOD WIDTH (FEET) = 53.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.58
 STREET FLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 38.10
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.300
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                           SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       В
                                  2.08
                                           0.75
                                                   0.900
                                                            56
                        В
                                 0.94
                                       0.75 0.600
                                                           56
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
 S-GRAPH: VALLEY (DEV.) = 24.4%; VALLEY (UNDEV.) / DESERT= 75.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.63; LAG(HR) = 0.51; Fm(INCH/HR) = 0.62; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
                                                  842.2
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 12852.86 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0526; Lca/L=0.4,n=.0472; Lca/L=0.5,n=.0433; Lca/L=0.6,n=.0404
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 154.27
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                       587.30
 TOTAL AREA(ACRES) = 842.2
                                    PEAK FLOW RATE (CFS) = 598.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

Page 52

Date: 04/21/2014

FLOW PROCESS FROM NODE 20273.00 TO NODE 20274.00 IS CODE = 63

Date: 04/21/2014 File name: LR0202ZZ.RES Page 51

```
DEPTH(FEET) = 1.20 HALFSTREET FLOOD WIDTH(FEET) = 53.17
 FLOW VELOCITY (FEET/SEC.) = 10.45 DEPTH*VELOCITY (FT*FT/SEC.) = 12.58
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.35
 PIPE-FLOW(CFS) = 484.27
 PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 37.42
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
 S-GRAPH: VALLEY (DEV.) = 24.4%; VALLEY (UNDEV.) / DESERT= 75.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.62; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 842.2
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 13650.41 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0481; Lca/L=0.4, n=.0431; Lca/L=0.5, n=.0396; Lca/L=0.6, n=.0369
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 154.27
 TOTAL AREA (ACRES) = 842.2 PEAK FLOW RATE (CFS) = 598.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 114.28
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.94
********************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 PEAK FLOW RATE (CFS) = 598.55 Tc (MIN.) = 37.42
 AREA-AVERAGED Fm (INCH/HR) = 0.62 Ybar = 0.64
 TOTAL AREA (ACRES) = 842.2
 ** CONFLUENCE DATA **
 STREAM
         Q Tc
                         AREA
                                  HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
   1 1543.19 41.19 2259.75 20120.00
          598.55 37.42 842.18 20260.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
```

Date: 04/21/2014

```
RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.01;3H= 1.83;6H= 2.65;24H= 5.86
 S-GRAPH: VALLEY(DEV.) = 35.0%; VALLEY(UNDEV.)/DESERT= 65.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.59; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.86; 30M = 0.86; 1HR = 0.86;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0419; Lca/L=0.4,n=.0375; Lca/L=0.5,n=.0345; Lca/L=0.6,n=.0322
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 654.44
 PEAK FLOW RATE (CFS) = 1957.45
******************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 3101.9 TC (MIN.) =
                                       41.19
 AREA-AVERAGED Fm (INCH/HR) = 0.59 Ybar = 0.59
 PEAK FLOW RATE (CFS) = 1957.45
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Page 53 Date: 04/21/2014 File name: LR0202ZZ.RES Page 54

Date: 04/21/2014 File name: LR0202ZZ.RES Page 55 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20376

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0203ZZ.DAT

TIME/DATE OF STUDY: 15:55 10/25/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9700

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 24.0 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 18	20.0	10.0 15.0	0.020/0.020/	/0.020 /0.020	0.50	1.50	0.0312 0	.125	0.0180
19	52.0	20.0	0.020/0.020/	0.020	0.67	2.00	0.0312 0	.167	0.0180
2 *S1	1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T	lve Flow-I aximum Ala n)*(Veloc: WITH A FI TO THE UPS	DEPTH CONSTRAI Depth = 0.20 lowable Street ity) Constrain LOW CAPACITY ( STREAM TRIBUTI IMUM TOPOGRAPI	FEET Flow Dent = 6.0 GREATER TARY PIPE.	O (FT*FT CHAN .*	/S)		TED	
05	SEK-SPECI	TETED MIN.	IMOM TOPOGRAPI	IIC SLOPE	E ADOUGI	MEINI	NOI SELEC	IED	
V 1 1 1 2	WATERSHEI USED "VAI 1 UNITS/# FOR DEVEI PRECIPIT# SIERRA M#	D LAG = 0. LLEY UNDEV ACRE AND 1 LOPMENTS ( ATION DATA ADRE DEPTE	EL SELECTIONS, .80 * TC VELOPED" S-GRA LESS; AND "VAI DF 2 UNITS/ACA A ENTERED ON S H-AREA FACTORS CONDITION (AN	APH FOR I LLEY DEVE RE AND MO SUBAREA E USED.	DEVELOPM ELOPED" DRE. BASIS.	S-GRA	PH	RAPH	METHOD
****	******	*****	*****	******	******	****	*****	****	*****
FLO	OW PROCES	SS FROM NO	ODE 20300.00	TO NODE	20301.	00 IS	CODE =	21	
			O INITIAL SUBA	AREA ANAI	 LYSIS<<<	 <<			
J<<	JSE TIME-	-OF-CONCE	D INITIAL SUBA	AREA ANAI GRAPH FOF	LYSIS<<< R INITIA	 << L SUB	 AREA<<		
>>	JSE TIME-	-OF-CONCE	NTRATION NOMO	AREA ANAI GRAPH FOE	LYSIS<<< R INITIA	 << L SUB	 AREA<<	====	
)<< 	USE TIME- ====== ITIAL SUE	OF-CONCEN	NTRATION NOMOC	AREA ANAI GRAPH FOF ===================================	 LYSIS<<< R INITIA  3.37	 << L SUB =====	AREA<<		
>>U ===== INI ELE	USE TIME- ====== ITIAL SUE EVATION I	OF-CONCER	NTRATION NOMOC ===================================	AREA ANAI GRAPH FOF ======== = 658 2600.0	LYSIS<<< R INITIA ======= 3.37 00 DOWN	 << L SUB ====	AREA<<		
>>U ===== INI ELF TC	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE	OF-CONCENTION  BAREA FLOW  DATA: UPST  ENGTH** 3	NTRATION NOMOC 	AREA ANAI GRAPH FOF ===================================	LYSIS<<< R INITIA REPORT NATIONAL PROPERTY NATIO	 << L SUB ==== STREA	AREA<<		
>>U INI ELE Tc SUE	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA	OF-CONCENTION  BAREA FLOW  DATA: UPS  ENGTH** 3	NTRATION NOMOC ===================================	AREA ANAI GRAPH FOF ===================================	CYSIS<<< R INITIA BROWN DOWN DOWN B.28 3.28	 << L SUB ==== STREA	AREA<<		
>>U	USE TIME-  ITIAL SUE  EVATION I  = K*[(LE  BAREA ANA  25 YEAR  BAREA TC	OF-CONCEN BAREA FLOW DATA: UPST ENGTH** 3 ALYSIS USI RAINFALL AND LOSS	NTRATION NOMOG 	AREA ANAI GRAPH FOF = 658 2600.0 DN CHANGE (MIN.) = CH/HR) =	CYSIS<<< R INITIA 3.37 00 DOWN E)]**0.2 8.28 3.181	< << L SUB ===== STREA 0 7	AREA<< ======= M(FEET) =	24	00.00
>>U	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN	OF-CONCEN  BAREA FLOW  CONTA: UPS:  CONGTH** 3  ALYSIS USI  RAINFALL  AND LOSS  NT TYPE/	NTRATION NOMOG W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATION ED MINIMUM TO INTENSITY (INC RATE DATA (AMC SCS SOIL	AREA ANAI GRAPH FOF  = 658 2600.0  ON CHANGE (MIN.) =  CH/HR) =  C II):  AREA	CYSIS<<< R INITIA 3.37 00 DOWN E)]**0.2 8.28 3.181 Fp	<- L SUB ==== STREA 0 7	AREA<< ======= M(FEET) =	24 SCS	00.00 Tc
>>U INI ELE TC SUE * SUE DE	USE TIME-  ITIAL SUE EVATION I  K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U	OF-CONCENTION OF TYPE/ JOHN TO THE TYPE/ JOHN TO THE TYPE/ JOHN TO THE TYPE/ JSE	NTRATION NOMOG 	AREA ANAI GRAPH FOF  = 658 2600.0  ON CHANGE (MIN.) =  CH/HR) =  C II):  AREA	CYSIS<<< R INITIA 3.37 00 DOWN E)]**0.2 8.28 3.181 Fp	<- L SUB ==== STREA 0 7	AREA<< ======= M(FEET) =	24 SCS	00.00 Tc
>>U INI ELE TC SUE * SUE DE	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TURAL FAI	OF-CONCEN BAREA FLOW DATA: UPST ENGTH** 3 ALYSIS USI RAINFALL AND LOSS WI TYPE/ JSE ER COVER	NTRATION NOMOG W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATION ED MINIMUM TO INTENSITY (INC RATE DATA (AMO SCS SOIL GROUP	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA (ACRES)	CYSIS<<< R INITIA  3.37 00 DOWN  E)]**0.2 8.28 3.181  Fp (INCH/	<li>&lt;&lt; SUB</li> <li>STREA</li> <li>7</li> <li>HR)</li>	AREA<< =======  M(FEET) =  Ap (DECIMAL)	SCS CN	00.00 Tc (MIN.
>>U INI ELE TC SUE * SUE DE NAT	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TURAL FAI PEN BRUSH	-OF-CONCEN	NTRATION NOMOG W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATION ED MINIMUM TO INTENSITY (INC RATE DATA (AMO SCS SOIL GROUP	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA (ACRES)	CYSIS<<< R INITIA  3.37 00 DOWN  E)]**0.2 8.28 3.181  Fp (INCH/	<li>&lt;&lt; SUB</li> <li>STREA</li> <li>7</li> <li>HR)</li>	AREA<< ======= M(FEET) =	SCS CN	00.00 Tc (MIN.
>>U INI ELE TC SUE * SUE DE NAT	USE TIME-  ITIAL SUE EVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC LAND I  TURAL FAI PEN BRUSE SIDENTIAL	-OF-CONCEN	NTRATION NOMOG W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATION ED MINIMUM TO INTENSITY (INC RATE DATA (AMO SCS SOIL GROUP	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA (ACRES)	EYSIS<<< R INITIA B.337 DO DOWN B.28 3.181 Fp (INCH/	<< L SUB ==== STREA  0 7  HR)	AREA<< M(FEET) =  Ap (DECIMAL)  1.000	SCS CN	Tc (MIN.
>>U INI ELE TC SUE * SUE DE NAT "OF RES	USE TIME-  ===================================	-OF-CONCEN	NTRATION NOMOG 	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA (ACRES) 6.22	EYSIS<<< R INITIA B B B B B B B B B B B B B B B B B B B	 << L SUB ===== STREA 0 7 HR) 61	AREA<< M(FEET) =  Ap (DECIMAL)  1.000  0.900	SCS CN	Tc (MIN.
>>U INI ELE TC SUH * SUH DF NAT "OF RES ".4 SUH SUH SUH SUH SUH	JSE TIME-  ITIAL SUE EVATION I  BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TURAL FAIL PEN BRUSH SIDENTIAL 4 DWELLIN BAREA AVE BAREA AVE	-OF-CONCENT	NTRATION NOMOC 	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = C II): AREA (ACRES) 6.22 0.99 TE, Fp(IN	EYSIS<<< R INITIA BERNELLE STATE STA	<pre> &lt;&lt; L SUB ===== STREA 0 7 HR) 61 75 = 0.</pre>	AREA<< M(FEET) =  Ap (DECIMAL)  1.000  0.900	SCS CN	Tc (MIN.
INITIAL TC SUH * SUH DE NATURE SUH	JSE TIME-  ITIAL SUE EVATION I	OF-CONCENT BAREA FLOW DATA: UPST CONGTH** 3 ALYSIS USI RAINFALL AND LOSS MI TYPE/ JUSE LIC COVER H" LIC COVER H" LIC CAGE PERV MOFF (CFS)	NTRATION NOMOGETURE NOT	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = CI): AREA (ACRES) 6.22 0.99 PE, Fp(IN	EYSIS<<< R INITIA ===================================	 << SUB  STREA 0 7 HR) 61 75 = 0.	AREA<< ======= M(FEET) =  Ap (DECIMAL)  1.000  0.900 63	SCS CN 66	Tc (MIN.
INITIAL TC SUH * SUH DE NATURE SUH	JSE TIME-  ITIAL SUE EVATION I	-OF-CONCENT	NTRATION NOMOGETURE NOT	AREA ANAI GRAPH FOR = 658 2600.0 ON CHANGE (MIN.) = CH/HR) = CI): AREA (ACRES) 6.22 0.99 PE, Fp(IN	EYSIS<<< R INITIA ===================================	 << SUB  STREA 0 7 HR) 61 75 = 0.	AREA<< M(FEET) =  Ap (DECIMAL)  1.000  0.900	SCS CN 66	Tc (MIN.
INI ELF TC SUF * SUF NAT "OF RES ".4 SUF	USE TIME- ======= ITIAL SUE EVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TURAL FAI PEN BRUSH SIDENTIAI 4 DWELLIN BAREA AVE BAREA RUN TAL AREA	-OF-CONCENTED-CO	NTRATION NOMOCOMPACTION NOMOCOMPACTI	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) = CH/HR) = CH/HR) = CH/HR  C II): AREA (ACRES)  6.22  0.99  TE, Fp(IN ACTION, A	CYSIS<<< R INITIA BROWN BROWN CONTROL BROWN	 << SUB  STREA 0 7 HR) 61 75 = 0.	AREA<< ======= M(FEET) =  Ap (DECIMAL)  1.000  0.900 63	SCS CN 66	Tc (MIN.
>>U INI ELE TC SUH * SUH DE NAT "OF RES ".4 SUH SUH SUH SUH SUH SUH SUH SUH SUH	JSE TIME-  ITIAL SUE EVATION I  BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TUANL FAIL PEN BRUSH SIDENTIAI 4 DWELLIN BAREA AVE BAREA AVE BAREA RUN TAL AREA	-OF-CONCENT	NTRATION NOMOGOUS CONTRATION NOMOGOUS CONTRACT OF THE AMOUNT OF THE AMOU	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) = CH/HR) = CH/HR) = CH/HR  C II): AREA (ACRES)  6.22  0.99  TE, Fp(IN ACTION, F	CYSIS<<< R INITIA REPORT NAME   3.37   00	 << SUB SUB ===== STREA 0 7 61 75 = 0 . 9986 FS) =	AREA<< =======  M(FEET) =  Ap (DECIMAL)  1.000  0.900 63	SCS CN 66 56	TC (MIN. 12.0 8.2
>>U INI ELE TC SUH * SUH DE NAT "OF RES ".4 SUH SUH TOT	JSE TIME-  ITIAL SUE EVATION I  BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U TUANL FAIL PEN BRUSH SIDENTIAI 4 DWELLIN BAREA AVE BAREA AVE BAREA RUN TAL AREA	-OF-CONCENT	NTRATION NOMOCOMPACTION NOMOCOMPACTI	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) = CH/HR) = CH/HR) = CH/HR  C II): AREA (ACRES)  6.22  0.99  TE, Fp(IN ACTION, F	CYSIS<<< R INITIA REPORT NAME   3.37   00	 << SUB SUB ===== STREA 0 7 61 75 = 0 . 9986 FS) =	AREA<< =======  M(FEET) =  Ap (DECIMAL)  1.000  0.900 63	SCS CN 66 56	TC (MIN. 12.0 8.2
INI ELH TC SUH * SUH DE NAT "OH RESS ".4 SUH	JSE TIME-  ITIAL SUE  EVATION I  E K*[(LE  BAREA ANF 25 YEAR  BAREA TC  EVELOPMEN LAND U  TURNELLIN  BAREA AVE  BAREA AVE  BAREA AVE  BAREA AVE  BAREA AVE  BAREA ARE  E 0.36;	-OF-CONCENT	NTRATION NOMOGOUS CONTRATION NOMOGOUS CONTRACT OF THE AMOUNT OF THE AMOU	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) =  CH/HR) =  C	CYSIS<<< R INITIA B.337 00 DOWN E)]**0.2 8.28 3.181 Fp (INCH/ 0. NCH/HR) Ap = 0. W RATE(C H): 1.70; 6		AP (DECIMAL)  1.000  0.900 63  16.6	SCS CN 66 56	TC (MIN. 12.0 8.2
>>\text{INI} ELF  Tc SUF  * SUF DE  NAT "OF RESS ".4 SUF	JSE TIME-  ITIAL SUE EVATION I  BAREA ANF 25 YEAR BAREA TC EVELOPMEN LAND U FEN BRUSH SIDENTIAL BAREA AVE BAREA AVE BAREA AVE BAREA RU BAREA ARE	OF-CONCENT DESCRIPTION OF CONCENT BAREA FLOW DATA: UPS: BAREA FLOW DATA: UPS: BAREA FLOW DATA: UPS: BALLYSIS USI RAINFALL AND LOSS WI TYPE/ USE UR COVER H" USE BAGE PERV DOFF (CFS) (ACRES) =  CA-AVERAGE 30M = 0.	NTRATION NOMOCOMPANTATION NOMOCOMPANTATI	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) =  CH/HR) =  C	CYSIS<<< R INITIA  3.37 00 DOWN  E)]**0.2 8.28 3.181  Fp (INCH/  0.  NCH/HR) Ap = 0.  W RATE (C  H): 1.70; 6		AP (DECIMAL)  1.000  0.900 63  16.6	SCS CN 66 56 1 R = 5	TC (MIN. 12.0 8.2
>>VICTOR SUPPLY OF S	USE TIME- ======= ITIAL SUE EVATION I  = K*[(LE BAREA ANA 25 YEAR 25 YEAR EVELOPMEN LAND (LOURAL FAI PEN BRUSH SIDENTIAL 4 DWELLIN BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.36; ************************************	-OF-CONCENERAL FLOW DATA: UPS' BAREA FLOW DATA: UPS' BAREA FLOW DATA: UPS' BAREA FLOW DATA: UPS' BRAINFALL AND LOSS BRITT TYPE/ JUSE BRAGE PERI	NTRATION NOMOCOMPANTATION NOMOCOMPANTATI	AREA ANAI GRAPH FOR  = 658 2600.0  ON CHANGE (MIN.) = CH/HR) = CH/	CYSIS<<< R INITIA  3.37 00 DOWN  E)]**0.2 8.28 3.181  Fp (INCH//  0. NCH/HR) Ap = 0. W RATE(C  H): 1.70; 6		AREA<	SCS CN 66 56 1 R = 5	TC (MIN. 12.0 8.2

ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2380.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 422.45 CHANNEL SLOPE = 0.0473

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.34 FLOW DEPTH (FEET) = 0.38
 TRAVEL TIME (MIN.) = 3.01 Tc (MIN.) = 11.30
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20302.00 = 1080.82 FEET.
******************
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20302.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 11.30
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.642
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   В
                          0.12
                                   0.75
                                          0.900
                                                56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                           4.14
                                   0.61
                                         1.000
                                                66
 SCHOOL
                     В
                            3.66
                                   0.75
                                         0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
 SUBAREA AREA(ACRES) = 7.92
                           SUBAREA RUNOFF (CFS) = 14.99
 EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.90
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                 28.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20303.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2380.00 DOWNSTREAM(FEET) = 2320.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 870.68 CHANNEL SLOPE = 0.0689
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            28.10
 FLOW VELOCITY (FEET/SEC.) = 3.12 FLOW DEPTH (FEET) = 0.42
 TRAVEL TIME (MIN.) = 4.65 Tc (MIN.) = 15.95
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20303.00 = 1951.50 FEET.
******************
 FLOW PROCESS FROM NODE 20303.00 TO NODE 20303.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 15.95
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.148
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                           αA
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            4.15
                                   0.61
                                          1.000 66
```

```
RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В
                          0.80
                                   0.75 0.900
                           20.38 0.75 0.600
 SCHOOL
                     B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA(ACRES) = 25.33
                          SUBAREA RUNOFF (CFS) = 37.96
 EFFECTIVE AREA(ACRES) = 40.46 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.76
 TOTAL AREA(ACRES) = 40.5
                            PEAK FLOW RATE(CFS) =
                                                 59.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20303.00 TO NODE 20304.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2320.00 DOWNSTREAM(FEET) = 2280.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 981.07 CHANNEL SLOPE = 0.0408
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            59.34
 FLOW VELOCITY (FEET/SEC.) = 3.06 FLOW DEPTH (FEET) = 0.62
 TRAVEL TIME (MIN.) = 5.34 Tc (MIN.) = 21.29
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20304.00 = 2932.57 FEET.
******************
 FLOW PROCESS FROM NODE 20304.00 TO NODE 20304.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 21.29
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.806
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   B 18.37 0.61 1.000
                                                 66
                          15.66 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.816
 SUBAREA AREA(ACRES) = 34.03
                           SUBAREA RUNOFF(CFS) = 38.84
 EFFECTIVE AREA(ACRES) = 74.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 74.5
                            PEAK FLOW RATE(CFS) =
                                                 85.73
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20304.00 TO NODE 20305.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2220.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 4

Date: 04/21/2014 File name: LR0203ZZ.RES Page 3

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 823.37 CHANNEL SLOPE = 0.0729
                                                                         RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                         "2 DWELLINGS/ACRE"
                                                                                                 1.66
                                                                                                             0.75
                                                                                                                    0.700
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         NATURAL FAIR COVER
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            85.73
                                                                         "OPEN BRUSH"
                                                                                              В
                                                                                                 13.33
                                                                                                             0.61 1.000
 FLOW VELOCITY (FEET/SEC.) = 4.14 FLOW DEPTH (FEET) = 0.64
                                                                                                    2.17
                                                                                                             0.75 0.600
                                                                         SCHOOL
                                                                                              В
 TRAVEL TIME (MIN.) = 3.32 Tc (MIN.) = 24.61
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20305.00 = 3755.94 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.920
                                                                         SUBAREA AREA (ACRES) = 17.16
                                                                                                     SUBAREA RUNOFF (CFS) = 14.33
EFFECTIVE AREA(ACRES) = 109.51 AREA-AVERAGED Fm(INCH/HR) = 0.54
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20305.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                         TOTAL AREA (ACRES) = 109.5
                                                                                                      PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 24.61
                                                                         5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.656
                                                                        ******************
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                  SCS
                                                                         FLOW PROCESS FROM NODE 20306.00 TO NODE 20307.00 IS CODE = 54
                                            Ар
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "OPEN BRUSH"
                    В
                            9.94
                                     0.61
                                            1.000
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                 66
                                                                        ______
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.01
                                    0.75
                                            0.700
                                                 56
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2185.00
 SCHOOL
                     В
                            7.91
                                    0.75
                                            0.600 56
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 181.13 CHANNEL SLOPE = 0.0276
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.823
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AREA (ACRES) = 17.86 SUBAREA RUNOFF (CFS) = 17.92
                                                                         CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                      95.95
 EFFECTIVE AREA(ACRES) = 92.35 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                         FLOW VELOCITY (FEET/SEC.) = 2.97 FLOW DEPTH (FEET) = 0.80
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
                                                                         TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 29.65
                                                                         LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20307.00 = 4739.04 FEET.
 TOTAL AREA (ACRES) = 92.3 PEAK FLOW RATE (CFS) =
                                                  93.58
                                                                        ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
                                                                         FLOW PROCESS FROM NODE 20307.00 TO NODE 20307.00 IS CODE = 81
                                                                        ______
******************
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20306.00 IS CODE = 54
                                                                        ______
______
                                                                         MAINLINE Tc(MIN.) = 29.65
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.481
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                         SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                    αA
 ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2190.00
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 801.97 CHANNEL SLOPE = 0.0374
                                                                         RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                            в 1.33
                                                                                                             0.75
                                                                                                                    0.700
                                                                         "2 DWELLINGS/ACRE"
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                         RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             93.58
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                              В 0.26
                                                                                                             0.75 0.600
 FLOW VELOCITY (FEET/SEC.) = 3.32 FLOW DEPTH (FEET) = 0.75
                                                                         NATURAL FAIR COVER
                                                                                                     3.26
 TRAVEL TIME (MIN.) = 4.02 Tc (MIN.) = 28.63
                                                                         "OPEN BRUSH"
                                                                                              R
                                                                                                             0.61 1.000
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20306.00 = 4557.91 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.896
SUBAREA AREA(ACRES) = 4.85
                                                                                                    SUBAREA RUNOFF (CFS) = 3.93
 FLOW PROCESS FROM NODE 20306.00 TO NODE 20306.00 IS CODE = 81
                                                                         EFFECTIVE AREA(ACRES) = 114.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.82
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         TOTAL AREA (ACRES) = 114.4
                                                                                                      PEAK FLOW RATE(CFS) =
______
 MAINLINE Tc(MIN.) = 28.63
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.512
                                                                         5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                  SCS
                                          Аp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                         FLOW PROCESS FROM NODE 20307.00 TO NODE 20308.00 IS CODE = 54
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Date: 04/21/2014 File name: LR0203ZZ.RES Page 6

66

95.95

56

96.79

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
_____
                                                                                 ***STREET FLOWING FULL***
 ELEVATION DATA: UPSTREAM(FEET) = 2185.00 DOWNSTREAM(FEET) = 2175.00
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL LENGTH THRU SUBAREA (FEET) = 269.83 CHANNEL SLOPE = 0.0371
                                                                                STREET FLOW DEPTH (FEET) = 0.61
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 23.26
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.57
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              96.79
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.18
 FLOW VELOCITY (FEET/SEC.) = 3.35 FLOW DEPTH (FEET) = 0.76
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 31.83
 TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 30.99
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.419
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20308.00 = 5008.87 FEET.
                                                                               SUBAREA LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/
                                                                                                 SCS SOIL AREA
                                                                                                                  Fр
******************
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   LAND USE
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20308.00 IS CODE = 81
                                                                               NATURAL FAIR COVER
______
                                                                                                   B 1.71
                                                                                                                     0.61
                                                                                                                             1.000
                                                                               "OPEN BRUSH"
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                               RESIDENTIAL
______
                                                                               "2 DWELLINGS/ACRE" B 2.80
                                                                                                                     0.75 0.700
 MAINLINE Tc(MIN.) = 30.99
                                                                               RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.442
                                                                               "3-4 DWELLINGS/ACRE" B 1.00 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               SUBAREA AREA(ACRES) = 5.51 SUBAREA RUNOFF(CFS) = 4.37
                                                                               EFFECTIVE AREA(ACRES) = 123.88 AREA-AVERAGED Fm(INCH/HR) = 0.54
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 2.10
                                       0.75
                                               0.700
                                                     56
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                               TOTAL AREA(ACRES) = 123.9 PEAK FLOW RATE(CFS) = 97.98
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65
                                       0.75
                                               0.600
 NATURAL FAIR COVER
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "OPEN BRUSH"
                              1.26
                                       0.61 1.000
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA(ACRES) = 4.01
                              SUBAREA RUNOFF (CFS) = 3.26
                                                                               DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 23.20
 EFFECTIVE AREA(ACRES) = 118.37 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                               FLOW VELOCITY (FEET/SEC.) = 8.52 DEPTH*VELOCITY (FT*FT/SEC.) = 5.15
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                               LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20309.00 = 5439.79 FEET.
 TOTAL AREA (ACRES) = 118.4 PEAK FLOW RATE (CFS) =
                                                       96.79
                                                                             ******************
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               FLOW PROCESS FROM NODE 20309.00 TO NODE 20310.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                             ______
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20309.00 IS CODE = 63
                                                                               UPSTREAM ELEVATION(FEET) = 2150.00 DOWNSTREAM ELEVATION(FEET) = 2140.00
                                                                               STREET LENGTH (FEET) = 330.10 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2175.00 DOWNSTREAM ELEVATION(FEET) = 2150.00
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 430.92 CURB HEIGHT (INCHES) = 6.0
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

98.98

66

56

Page 8

Date: 04/21/2014 File name: LR0203ZZ.RES Date: 04/21/2014 File name: LR0203ZZ.RES Page 7

```
STREET FLOW DEPTH (FEET) = 0.67
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.385
   HALFSTREET FLOOD WIDTH (FEET) = 26.43
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.80
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.55
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 0.81 Tc (MIN.) = 32.63
                                                                                 RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.398
                                                                                 "2 DWELLINGS/ACRE"
                                                                                                      В 2.87
                                                                                                                        0.75
                                                                                                                               0.700
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 NATURAL FAIR COVER
                                                                                                     В 1.50
                                                                                                                        0.61 1.000
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                Αp
                                                                                 "OPEN BRUSH"
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.78 0.75 0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 3.69
                                                0.700
                                        0.75
                                                       56
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.772
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 0.85
                                        0.61
                                              1.000
                                                                                 SUBAREA AREA (ACRES) = 5.15 SUBAREA RUNOFF (CFS) = 3.92
                                                                                 EFFECTIVE AREA(ACRES) = 134.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.79
                                        0.75 0.600 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
                                                                                 TOTAL AREA (ACRES) = 134.4 PEAK FLOW RATE (CFS) = 102.26
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.733
 SUBAREA AREA (ACRES) = 5.33 SUBAREA RUNOFF (CFS) = 4.18
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 129.21 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 129.2 PEAK FLOW RATE (CFS) =
                                                         99.80
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 11.12 DEPTH*VELOCITY (FT*FT/SEC.) = 6.13
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50
                                                                                 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20311.00 = 6099.39 FEET.
                                                                               ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.43
                                                                                 FLOW PROCESS FROM NODE 20311.00 TO NODE 20312.00 IS CODE = 63
                                                                               ______
 FLOW VELOCITY (FEET/SEC.) = 6.78 DEPTH*VELOCITY (FT*FT/SEC.) = 4.54
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20310.00 = 5769.89 FEET.
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                               _____
 FLOW PROCESS FROM NODE 20310.00 TO NODE 20311.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION (FEET) = 2100.00 DOWNSTREAM ELEVATION (FEET) = 2060.00
                                                                                 STREET LENGTH (FEET) = 476.59 CURB HEIGHT (INCHES) = 6.0
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2140.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 329.50 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.61
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.12
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.56
                                                                                  STREET FLOW DEPTH(FEET) = 0.59
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.28
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 101.76
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.95
   ***STREET FLOWING FULL***
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 33.93
   STREET FLOW DEPTH (FEET) = 0.55
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.366
   HALFSTREET FLOOD WIDTH (FEET) = 20.51
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.12
                                                                                     LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 33.13
                                                                                 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 9 Date: 04/21/2014 File name: LR0203ZZ.RES Page 10

56

"2 DWELLINGS/ACRE" B 4.27 0.75 0.700 56  NATURAL FAIR COVER "OPEN BRUSH" B 5.25 0.61 1.000 66  RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.13 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.837  SUBAREA AREA(ACRES) = 10.65 SUBAREA RUNOFF(CFS) = 7.72  EFFECTIVE AREA(ACRES) = 145.01 AREA-AVERAGED Fm(INCH/HR) = 0.54  AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81  TOTAL AREA(ACRES) = 145.0 PEAK FLOW RATE(CFS) = 107.61  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  SM = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.770 SUBAREA AREA(ACRES) = 10.46 SUBAREA RUNOFF(CFS) = 7.54 EFFECTIVE AREA(ACRES) = 155.47 AREA-AVERAGED Fm(INCH/HR) = 0.54 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81 TOTAL AREA(ACRES) = 155.5 PEAK FLOW RATE(CFS) = 111.83  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50  END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.19 FLOW VELOCITY(FEET/SEC.) = 7.74 DEPTH*VELOCITY(FT*FT/SEC.) = 5.14 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20313.00 = 7076.27 FEET.
END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.59	**************************************
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20312.00 = 6575.98 FEET.	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
FLOW PROCESS FROM NODE 20312.00 TO NODE 20313.00 IS CODE = 63	UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2020.00 STREET LENGTH(FEET) = 462.82 CURB HEIGHT(INCHES) = 6.0
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00 STREET LENGTH(FEET) = 500.29 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00	<pre>INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020</pre>
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.73
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 115.52  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.66  HALFSTREET FLOOD WIDTH(FEET) = 26.13
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 111.38  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.66  HALFSTREET FLOOD WIDTH(FEET) = 26.13  AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.74	AVERAGE FLOW VELOCITY(FEET/SEC.) = 8.03 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.32 STREET FLOW TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 35.96 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.319 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.13 STREET FLOW TRAVEL TIME(MIN.) = 1.08 Tc(MIN.) = 35.00	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN NATURAL FAIR COVER
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.340 SUBAREA LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	"OPEN BRUSH" B 3.76 0.61 1.000 66  RESIDENTIAL "2 DWELLINGS/ACRE" B 5.77 0.75 0.700 56
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 56
"2 DWELLINGS/ACRE" B 6.45 0.75 0.700 56 RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.796
"3-4 DWELLINGS/ACRE" B 1.19 0.75 0.600 56  NATURAL FAIR COVER	SUBAREA AREA(ACRES) = 10.63 SUBAREA RUNOFF(CFS) = 7.37  EFFECTIVE AREA(ACRES) = 166.10 AREA-AVERAGED Fm(INCH/HR) = 0.54
"OPEN BRUSH" B 2.82 0.61 1.000 66	AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81

Date: 04/21/2014

File name: LR0203ZZ.RES

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 12

```
TOTAL AREA (ACRES) = 166.1 PEAK FLOW RATE (CFS) = 116.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.32
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.19
 FLOW VELOCITY (FEET/SEC.) = 8.04 DEPTH*VELOCITY (FT*FT/SEC.) = 5.34
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20314.00 = 7539.09 FEET.
******************
 FLOW PROCESS FROM NODE 20314.00 TO NODE 20315.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 1980.00
 STREET LENGTH (FEET) = 511.41 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 119.38
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.63
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.15
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 36.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.300
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.85
                                          0.75
                                                  0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.24
                                          0.75
                                                  0.600
                                                        56
 NATURAL FAIR COVER
                               1.05
 "OPEN BRUSH"
                         В
                                         0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.721
 SUBAREA AREA(ACRES) = 9.14
                               SUBAREA RUNOFF (CFS) = 6.39
 EFFECTIVE AREA(ACRES) = 175.24 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 175.2 PEAK FLOW RATE (CFS) = 119.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.01
```

```
DEPTH (FEET) = 0.61 HALFSTREET FLOOD WIDTH (FEET) = 23.63
 FLOW VELOCITY (FEET/SEC.) = 10.07 DEPTH*VELOCITY (FT*FT/SEC.) = 6.17
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20315.00 = 8050.50 FEET.
******************
 FLOW PROCESS FROM NODE 20315.00 TO NODE 20316.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1980.00 DOWNSTREAM ELEVATION(FEET) = 1950.00
 STREET LENGTH (FEET) = 522.61 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 122.38
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.65
  HALFSTREET FLOOD WIDTH (FEET) = 25.28
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.06
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.85
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 37.78
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.280
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.12
                                       0.75
                                               0.700
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.25 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 7.37 SUBAREA RUNOFF (CFS) = 5.10
 EFFECTIVE AREA(ACRES) = 182.61 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 182.6 PEAK FLOW RATE(CFS) =
                                                    121.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.21
 FLOW VELOCITY (FEET/SEC.) = 9.06 DEPTH*VELOCITY (FT*FT/SEC.) = 5.83
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20316.00 = 8573.11 FEET.
FLOW PROCESS FROM NODE 20316.00 TO NODE 20317.00 IS CODE = 63
```

END OF SUBAREA STREET FLOW HYDRAULICS:

Date: 04/21/2014 File name: LR0203ZZ.RES Page 13

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 14

```
UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   STREET LENGTH (FEET) = 640.63 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 743.58 CURB HEIGHT (INCHES) = 6.0
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.70
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 26.56
   ***STREET FLOWING FULL***
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.47
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.68
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 40.25
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.81
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.233
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.25
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.31
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                           SCS
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 38.98
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                       LAND USE
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.256
                                                                                   RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   "3-4 DWELLINGS/ACRE" B 1.10
                                                                                                                            0.75
                                                                                                                                    0.600
                                                                                                                                            56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                         SCS
                                                                                   RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                        В 0.01
                                                                                   ".4 DWELLING/ACRE"
     LAND USE
                                                                                                                           0.75 0.900
                                                                                                                                            56
                                                                                   RESIDENTIAL
 RESIDENTIAL
                                                                                   "2 DWELLINGS/ACRE" B 10.92 0.75 0.700
 "2 DWELLINGS/ACRE" B 4.10
                                         0.75
                                                  0.700
                                                        56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.55
                                         0.75
                                                  0.600
                                                        56
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 RESIDENTIAL
                                                                                   SUBAREA AREA (ACRES) = 12.03 SUBAREA RUNOFF (CFS) = 7.75
                                                                                   EFFECTIVE AREA(ACRES) = 200.30 AREA-AVERAGED Fm(INCH/HR) = 0.54
 ".4 DWELLING/ACRE"
                       B 0.01
                                         0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
                                                                                   TOTAL AREA (ACRES) = 200.3 PEAK FLOW RATE (CFS) = 125.40
 SUBAREA AREA(ACRES) = 5.66
                              SUBAREA RUNOFF(CFS) = 3.84
 EFFECTIVE AREA(ACRES) = 188.27 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
                                                                                   5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 TOTAL AREA (ACRES) = 188.3 PEAK FLOW RATE (CFS) = 121.79
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.56
                                                                                   FLOW VELOCITY (FEET/SEC.) = 8.45 DEPTH*VELOCITY (FT*FT/SEC.) = 5.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                   LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20318.00 = 9957.32 FEET.
                                                                                  *******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.69
                                                                                   FLOW PROCESS FROM NODE 20318.00 TO NODE 20319.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 10.19 DEPTH*VELOCITY (FT*FT/SEC.) = 6.25
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20317.00 = 9316.69 FEET.
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
******************
                                                                                  _____
 FLOW PROCESS FROM NODE 20317.00 TO NODE 20318.00 IS CODE = 63
                                                                                   UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1835.00
                                                                                   STREET LENGTH (FEET) = 624.00 CURB HEIGHT (INCHES) = 6.0
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
```

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 16

Date: 04/21/2014 File name: LR0203ZZ.RES

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 172.86
  ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.76
 HALFSTREET FLOOD WIDTH (FEET) = 31.01
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.66
 PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 6.58
STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 41.45
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.211
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                         Fρ
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 1.46
                                          0.75
                                                  0.600
                                                         56
RESIDENTIAL
".4 DWELLING/ACRE"
                      В 9.05
                                          0.75
                                                   0.900
                                                           56
RESIDENTIAL
"2 DWELLINGS/ACRE" B 100.00
                                          0.75
                                                   0.700
                                                           56
RESIDENTIAL
"2 DWELLINGS/ACRE"
                       В 28.82
                                          0.75
                                                  0.700
                                                          56
NATURAL FAIR COVER
                        B
"OPEN BRUSH"
                               18.27
                                          0.61
                                                 1.000 66
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.745
SUBAREA AREA(ACRES) = 157.60
                             SUBAREA RUNOFF(CFS) = 94.90
EFFECTIVE AREA(ACRES) = 357.90 AREA-AVERAGED Fm(INCH/HR) = 0.54
AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
TOTAL AREA (ACRES) = 357.9 PEAK FLOW RATE (CFS) =
                                                         216.42
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.68
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 33.88
FLOW VELOCITY (FEET/SEC.) = 9.13 DEPTH*VELOCITY (FT*FT/SEC.) = 7.47
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.27
PIPE-FLOW(CFS) = 41.74
PIPEFLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 41.03
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.218
SUBAREA AREA (ACRES) = 157.60 SUBAREA RUNOFF (CFS) = 95.95
TOTAL AREA (ACRES) = 357.9 PEAK FLOW RATE (CFS) = 218.80
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.68
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 177.06
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.32
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.70
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.67
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 624.0 FT WITH ELEVATION-DROP = 25.0 FT, IS 319.4 CFS,
        WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20319.00
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20319.00 = 10581.32 FEET.
******************
 FLOW PROCESS FROM NODE 20319.00 TO NODE 20330.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1835.00 DOWNSTREAM ELEVATION (FEET) = 1813.00
 STREET LENGTH (FEET) = 597.75 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.76
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.47
 STREET FLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 42.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.198
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.71 0.75 0.600
 RESIDENTIAL.
 ".4 DWELLING/ACRE" B 2.91 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.841
 SUBAREA AREA (ACRES) = 3.62 SUBAREA RUNOFF (CFS) = 1.85
 EFFECTIVE AREA(ACRES) = 361.52 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 361.5 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

Page 18

Date: 04/21/2014

Date: 04/21/2014 File name: LR0203ZZ.RES Page 17

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.70
 FLOW VELOCITY (FEET/SEC.) = 8.66 DEPTH*VELOCITY (FT*FT/SEC.) = 7.45
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.76
 PIPE-FLOW(CFS) = 54.77
 PIPEFLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 41.75
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.206
 SUBAREA AREA(ACRES) = 3.62 SUBAREA RUNOFF(CFS) = 1.88
 TOTAL AREA (ACRES) = 361.5 PEAK FLOW RATE (CFS) = 218.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 164.03
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.28
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.30
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.
******************
 FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 41.75
 RAINFALL INTENSITY (INCH/HR) = 1.21
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.77
 EFFECTIVE STREAM AREA(ACRES) = 361.52
 TOTAL STREAM AREA(ACRES) = 361.52
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 218.80
******************
 FLOW PROCESS FROM NODE 20320.00 TO NODE 20321.00 IS CODE = 21
_____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1020.45
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2180.00
       Date: 04/21/2014 File name: LR0203ZZ.RES
                                                     Page 19
```

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 19.882
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.882
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp Ap SCS Tc
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 9.71 0.61 1.000 66 19.88
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 11.08
 TOTAL AREA(ACRES) = 9.71 PEAK FLOW RATE(CFS) = 11.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
*************************
 FLOW PROCESS FROM NODE 20321.00 TO NODE 20322.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2160.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 548.49 CHANNEL SLOPE = 0.0365
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 11.08
 FLOW VELOCITY (FEET/SEC.) = 1.93 FLOW DEPTH (FEET) = 0.34
 TRAVEL TIME (MIN.) = 4.73 Tc (MIN.) = 24.61
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20322.00 = 1568.94 FEET.
******************
 FLOW PROCESS FROM NODE 20322.00 TO NODE 20322.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 24.61
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.656
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Ар
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    B 15.34 0.61 1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.02 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 15.36 SUBAREA RUNOFF(CFS) = 14.40
 EFFECTIVE AREA(ACRES) = 25.07 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 25.1 PEAK FLOW RATE (CFS) =
                                                23.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20322.00 TO NODE 20323.00 IS CODE = 54
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
                                                                         LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
                                                                      RESIDENTIAL
 CHANNEL LENGTH THRU SUBAREA (FEET) = 479.58 CHANNEL SLOPE = 0.0209
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 1.89 FLOW DEPTH (FEET) = 0.50
 TRAVEL TIME (MIN.) = 4.23 Tc (MIN.) = 28.84
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20323.00 = 2048.52 FEET.
******************
 FLOW PROCESS FROM NODE 20323.00 TO NODE 20323.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 28.84
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.505
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 11.74
                                   0.75
                                         0.700
 NATURAL FAIR COVER
                          8.32
 "OPEN BRUSH"
                     В
                                   0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.824
 SUBAREA AREA(ACRES) = 20.06 SUBAREA RUNOFF(CFS) = 17.05
 EFFECTIVE AREA(ACRES) = 45.13 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.92
 TOTAL AREA (ACRES) =
                45.1 PEAK FLOW RATE(CFS) =
                                                37.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20323.00 TO NODE 20324.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         LAND USE
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                      RESIDENTIAL
______
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2100.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 676.85 CHANNEL SLOPE = 0.0739
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 37.17
 FLOW VELOCITY (FEET/SEC.) = 3.39 FLOW DEPTH (FEET) = 0.47
 TRAVEL TIME (MIN.) = 3.33 Tc (MIN.) = 32.17
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20324.00 = 2725.37 FEET.
*****************
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20324.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 32.17
```

Page 21

Date: 04/21/2014

File name: LR020377.RFS

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.410
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "2 DWELLINGS/ACRE"
                    B 14.74 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 14.74 SUBAREA RUNOFF (CFS) = 11.76
 EFFECTIVE AREA(ACRES) = 59.87 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 59.9 PEAK FLOW RATE (CFS) =
                                                   45.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20325.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2080.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 631.62 CHANNEL SLOPE = 0.0317
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               45.05
 FLOW VELOCITY (FEET/SEC.) = 2.59 FLOW DEPTH (FEET) = 0.59
 TRAVEL TIME (MIN.) = 4.07 Tc (MIN.) = 36.24
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20325.00 = 3356.99 FEET.
************************
 FLOW PROCESS FROM NODE 20325.00 TO NODE 20325.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 36.24
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.313
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                                     SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "2 DWELLINGS/ACRE"
                     B 10.91 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 10.91
                             SUBAREA RUNOFF(CFS) = 7.75
 EFFECTIVE AREA(ACRES) = 70.78 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 TOTAL AREA(ACRES) = 70.8
                               PEAK FLOW RATE (CFS) =
                                                     47.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20325.00 TO NODE 20326.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
_____
                                                                              LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2050.00
                                                                          RESIDENTIAL
                                                                                                     16.19 0.75 0.700
 CHANNEL LENGTH THRU SUBAREA (FEET) = 686.64 CHANNEL SLOPE = 0.0437
                                                                          "2 DWELLINGS/ACRE"
                                                                                             В
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                          SUBAREA AREA(ACRES) = 16.19
                                                                                                     SUBAREA RUNOFF (CFS) = 8.71
                             47.55
 FLOW VELOCITY (FEET/SEC.) = 2.95 FLOW DEPTH (FEET) = 0.57
                                                                          EFFECTIVE AREA(ACRES) = 135.22 AREA-AVERAGED Fm(INCH/HR) = 0.55
 TRAVEL TIME (MIN.) = 3.87 Tc (MIN.) = 40.11
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20326.00 = 4043.63 FEET.
                                                                          TOTAL AREA (ACRES) = 135.2
                                                                                                       PEAK FLOW RATE(CFS) =
                                                                          NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*****************
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 FLOW PROCESS FROM NODE 20326.00 TO NODE 20326.00 IS CODE = 81
                                                                          5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         ******************
______
                                                                          FLOW PROCESS FROM NODE 20327.00 TO NODE 20328.00 IS CODE = 54
 MAINLINE Tc (MIN.) = 40.11
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.235
                                                                         ______
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                    Fρ
                                             αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         LAND USE
 RESIDENTIAL
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1920.00
 "2 DWELLINGS/ACRE"
                    в 48.19
                                     0.75
                                            0.700
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 1079.99 CHANNEL SLOPE = 0.0648
 RESIDENTIAL
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 "3-4 DWELLINGS/ACRE" B 0.06
                                     0.75
                                           0.600
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                          FLOW VELOCITY (FEET/SEC.) = 3.81 FLOW DEPTH (FEET) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 48.25
                            SUBAREA RUNOFF (CFS) = 30.90
                                                                          TRAVEL TIME (MIN.) = 4.72 Tc (MIN.) = 51.83
 EFFECTIVE AREA(ACRES) = 119.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                          LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20328.00 = 6513.41 FEET.
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
                                                                         ******************
 TOTAL AREA(ACRES) = 119.0 PEAK FLOW RATE(CFS) =
                                                                          FLOW PROCESS FROM NODE 20328.00 TO NODE 20328.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         ______
******************
                                                                          MAINLINE Tc(MIN.) = 51.83
 FLOW PROCESS FROM NODE 20326.00 TO NODE 20327.00 IS CODE = 54
                                                                          * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.059
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                              LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
______
                                                                          RESIDENTIAL
 ELEVATION DATA: UPSTREAM(FEET) = 2050.00 DOWNSTREAM(FEET) = 1990.00
                                                                          "2 DWELLINGS/ACRE"
                                                                                              B 25.33
                                                                                                              0.75 0.700
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1389.79 CHANNEL SLOPE = 0.0432
                                                                          RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                             в 0.27
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                                              0.75 0.600
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            73.51
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699
                                                                          SUBAREA AREA(ACRES) = 25.60
 FLOW VELOCITY (FEET/SEC.) = 3.31 FLOW DEPTH (FEET) = 0.67
                                                                                                     SUBAREA RUNOFF (CFS) = 12.35
 TRAVEL TIME (MIN.) = 7.00 Tc (MIN.) = 47.11
                                                                          EFFECTIVE AREA(ACRES) = 160.82 AREA-AVERAGED Fm(INCH/HR) = 0.54
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20327.00 = 5433.42 FEET.
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
                                                                          TOTAL AREA (ACRES) =
                                                                                           160.8
                                                                                                       PEAK FLOW RATE (CFS) =
******************
 FLOW PROCESS FROM NODE 20327.00 TO NODE 20327.00 IS CODE = 81
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         ******************
______
 MAINLINE Tc(MIN.) = 47.11
                                                                          FLOW PROCESS FROM NODE 20328.00 TO NODE 20329.00 IS CODE = 63
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.121
 SUBAREA LOSS RATE DATA(AMC II):
                                                                          >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                                                                          >>>> (STREET TABLE SECTION # 5 USED) <<<<
```

Page 23

Date: 04/21/2014 File name: LR0203ZZ.RES

Date: 04/21/2014 File name: LR020377.RFS Page 24

73.51

SCS

56

74.80

αA

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
_____
 UPSTREAM ELEVATION(FEET) = 1920.00 DOWNSTREAM ELEVATION(FEET) = 1870.00
 STREET LENGTH(FEET) = 1075.25 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.95
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    LAND USE
   STREET FLOW DEPTH(FEET) = 0.58
                                                                                RESIDENTIAL
   HALFSTREET FLOOD WIDTH (FEET) = 22.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.35
                                                                                RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.29
                                                                                ".4 DWELLING/ACRE"
 STREET FLOW TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 54.27
                                                                                RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.030
                                                                                 "2 DWELLINGS/ACRE"
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp Ap
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 13.84 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 13.84
                            SUBAREA RUNOFF(CFS) = 6.31
 EFFECTIVE AREA(ACRES) = 174.66 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
 TOTAL AREA (ACRES) = 174.7 PEAK FLOW RATE (CFS) =
                                                        76.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.10
 FLOW VELOCITY (FEET/SEC.) = 7.33 DEPTH*VELOCITY (FT*FT/SEC.) = 4.26
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20329.00 = 7588.66 FEET.
******************
 FLOW PROCESS FROM NODE 20329.00 TO NODE 20330.00 IS CODE = 63
                                                                                TOTAL NUMBER OF STREAMS = 2
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1870.00 DOWNSTREAM ELEVATION(FEET) = 1813.00
 STREET LENGTH (FEET) = 927.52 CURB HEIGHT (INCHES) = 6.0
                                                                                AREA-AVERAGED Ap = 0.76
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ** CONFLUENCE DATA **
```

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    80.41
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.64
 STREET FLOW TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 56.16
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.009
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" B 0.48
                                         0.75
                                                 0.600
                                                         56
                      B 5.88
                                         0.75 0.900
                                                         56
                      B 11.27 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764
 SUBAREA AREA (ACRES) = 17.63 SUBAREA RUNOFF (CFS) = 6.95
 EFFECTIVE AREA(ACRES) = 192.29 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.76
 TOTAL AREA(ACRES) = 192.3 PEAK FLOW RATE(CFS) =
                                                          80.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.37
 FLOW VELOCITY (FEET/SEC.) = 8.17 DEPTH*VELOCITY (FT*FT/SEC.) = 4.64
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20330.00 = 8516.18 FEET.
***********************
 FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 56.16
 RAINFALL INTENSITY (INCH/HR) = 1.01
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 EFFECTIVE STREAM AREA(ACRES) = 192.29
 TOTAL STREAM AREA(ACRES) = 192.29
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                        HEADWATER
       Date: 04/21/2014
                        File name: LR0203ZZ.RES
                                                       Page 26
```

Date: 04/21/2014 Page 25 File name: LR020377.RFS

```
NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                  SUBAREA AREA (ACRES) = 13.70 SUBAREA RUNOFF (CFS) = 7.90
                                              (ACRES)
                                                          NODE
    1
           218.80 41.75 1.206 0.70(0.54)0.77 361.5 20300.00
                                                                                  EFFECTIVE AREA(ACRES) = 518.18 AREA-AVERAGED Fm(INCH/HR) = 0.54
           80.60 56.16 1.009 0.72(0.54) 0.76 192.3 20320.00
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
                                                                                  TOTAL AREA(ACRES) = 567.5
                                                                                                                 PEAK FLOW RATE (CFS) = 299.40
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 ** PEAK FLOW RATE TABLE **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
           299.40 41.75 1.206 0.71(0.54)0.77 504.5 20300.00
    1
                                                                                  DEPTH (FEET) = 1.03 HALFSTREET FLOOD WIDTH (FEET) = 44.31
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.67 DEPTH*VELOCITY (FT*FT/SEC.) = 7.92
    2
           234.82 56.16 1.009 0.71(0.54)0.77 553.8 20320.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 PEAK FLOW RATE (CFS) = 299.40 Tc (MIN.) = 41.75
                                                                                        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
 EFFECTIVE AREA(ACRES) = 504.48 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                  SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
                                                                                  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 TOTAL AREA (ACRES) =
                    553.8
                                                                                  ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.
                                                                                  ASSUME FULL-FLOWING PIPELINE
                                                                                  PIPE-FLOW VELOCITY(FEET/SEC.) = 13.28
*******************
                                                                                  PIPE-FLOW(CFS) = 110.26
 FLOW PROCESS FROM NODE 20330.00 TO NODE 20349.00 IS CODE = 63
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 43.43
______
                                                                                  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.178
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  SUBAREA AREA(ACRES) = 13.70 SUBAREA RUNOFF(CFS) = 8.13
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  TOTAL AREA (ACRES) = 567.5
                                                                                                                PEAK FLOW RATE (CFS) = 299.40
______
                                                                                  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UPSTREAM ELEVATION(FEET) = 1813.00 DOWNSTREAM ELEVATION(FEET) = 1785.00
 STREET LENGTH (FEET) = 1334.61 CURB HEIGHT (INCHES) = 8.0
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 189.14
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW DEPTH (FEET) = 0.89
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 37.41
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.81
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.09
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.91
                                                                                ********************
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 303.35
                                                                                  FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 1
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
   STREET FLOW DEPTH(FEET) = 1.04
                                                                                _____
   HALFSTREET FLOOD WIDTH (FEET) = 44.49
                                                                                  TOTAL NUMBER OF STREAMS = 2
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.71
                                                                                  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.99
                                                                                  TIME OF CONCENTRATION (MIN.) = 43.43
 STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 44.64
                                                                                  RAINFALL INTENSITY (INCH/HR) = 1.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.158
                                                                                  AREA-AVERAGED Fm(INCH/HR) = 0.54
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.71
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                                                                  AREA-AVERAGED Ap = 0.76
                                        Fр
                                                 Aр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  EFFECTIVE STREAM AREA(ACRES) = 518.18
 RESIDENTIAL
                                                                                  TOTAL STREAM AREA (ACRES) = 567.51
 "3-4 DWELLINGS/ACRE" B 1.05
                                         0.75
                                                 0.600
                                                       56
                                                                                  PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                                                  299.40
 RESIDENTIAL
                                                                                *****************
                      B 12.65
                                         0.75
                                                 0.700
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  FLOW PROCESS FROM NODE 20340.00 TO NODE 20341.00 IS CODE = 21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 27 Date: 04/21/2014 File name: LR0203ZZ.RES Page 28

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 998.88
 ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 2080.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.422
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.495
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               Αр
                                                    SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                              6.76
                                              0.700
                                                     56 13.21
                                       0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       B 1.12
                                      0.75
                                              0.600
                                                     56 12.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA RUNOFF (CFS) = 14.06
 TOTAL AREA (ACRES) = 7.88 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20341.00 TO NODE 20342.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2055.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 397.26 CHANNEL SLOPE = 0.0629
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              14.06
 FLOW VELOCITY (FEET/SEC.) = 2.54 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 2.61 Tc (MIN.) = 15.03
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20342.00 = 1396.14 FEET.
**********************
 FLOW PROCESS FROM NODE 20342.00 TO NODE 20342.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.226
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               Aр
                                                     SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                 В
                              4.25
                                       0.75
                                              0.700
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            0.25
                                      0.75
                                              0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA (ACRES) = 4.50
                              SUBAREA RUNOFF (CFS) = 6.91
 EFFECTIVE AREA(ACRES) = 12.38 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
```

```
TOTAL AREA(ACRES) = 12.4
                            PEAK FLOW RATE(CFS) =
                                              19.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20342.00 TO NODE 20343.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2035.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 438.38 CHANNEL SLOPE = 0.0456
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           19.06
 FLOW VELOCITY (FEET/SEC.) = 2.39 FLOW DEPTH (FEET) = 0.40
 TRAVEL TIME (MIN.) = 3.06 Tc (MIN.) = 18.09
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20343.00 = 1834.52 FEET.
******************
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20343.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 18.09
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.992
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                          5.37
                                   0.75
                                          0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                           0.37
                                   0.75 0.600
                                                56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA(ACRES) = 5.74
                           SUBAREA RUNOFF (CFS) = 7.61
 EFFECTIVE AREA(ACRES) = 18.12 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                 18.1
 TOTAL AREA (ACRES) =
                            PEAK FLOW RATE(CFS) =
                                                 24.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20344.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.72 CHANNEL SLOPE = 0.0403
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            24.06
 FLOW VELOCITY (FEET/SEC.) = 2.43 FLOW DEPTH (FEET) = 0.45
 TRAVEL TIME (MIN.) = 3.41 Tc (MIN.) = 21.50
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20344.00 = 2331.24 FEET.
      Date: 04/21/2014
```

File name: LR020377.RFS

Page 30

```
******************
 FLOW PROCESS FROM NODE 20344.00 TO NODE 20344.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.50
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.795
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αр
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                             2.06
                                      0.75
                                             0.700
                                                    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                              2.77
                                      0.75
                                             0.900
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                             0.07
                                      0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.812
 SUBAREA AREA (ACRES) = 4.90
                             SUBAREA RUNOFF (CFS) = 5.24
 EFFECTIVE AREA(ACRES) = 23.02 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 23.0
                             PEAK FLOW RATE(CFS) =
                                                    26.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20344.00 TO NODE 20345.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2015.00 DOWNSTREAM(FEET) = 1980.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 575.06 CHANNEL SLOPE = 0.0609
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             26.10
 FLOW VELOCITY (FEET/SEC.) = 2.90 FLOW DEPTH (FEET) = 0.42
 TRAVEL TIME (MIN.) = 3.31 Tc (MIN.) = 24.81
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20345.00 = 2906.30 FEET.
********************
 FLOW PROCESS FROM NODE 20345.00 TO NODE 20345.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 24.81
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.648
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fρ
                                              Ар
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                   56
 "2 DWELLINGS/ACRE"
                      В
                             12.00
                                      0.75
                                             0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             0.27
                                      0.75
                                             0.600
                                                    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                              3.29
                                      0.75
                                             0.900
                                                   56
      Date: 04/21/2014
                     File name: LR0203ZZ.RES
                                                   Page 31
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
 SUBAREA AREA(ACRES) = 15.56
                           SUBAREA RUNOFF (CFS) = 15.32
 EFFECTIVE AREA(ACRES) = 38.58 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 38.6
                             PEAK FLOW RATE(CFS) =
                                                 38.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20345.00 TO NODE 20346.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1940.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 558.59 CHANNEL SLOPE = 0.0716
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             38.35
 FLOW VELOCITY (FEET/SEC.) = 3.39 FLOW DEPTH (FEET) = 0.48
 TRAVEL TIME (MIN.) = 2.75 Tc (MIN.) = 27.56
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20346.00 = 3464.89 FEET.
******************
 FLOW PROCESS FROM NODE 20346.00 TO NODE 20346.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE TC(MIN.) = 27.56
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.547
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                          3.53
                                    0.75
                                          0.700
                                                 56
                   В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.62
                                    0.75
                                          0.600
                                                  56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                          3.41
                                    0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.782
 SUBAREA AREA(ACRES) = 7.56
                           SUBAREA RUNOFF (CFS) = 6.55
 EFFECTIVE AREA(ACRES) = 46.14 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 46.1
                             PEAK FLOW RATE (CFS) =
                                                  41.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20346.00 TO NODE 20347.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1940.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
```

```
STREET LENGTH (FEET) = 993.62 CURB HEIGHT (INCHES) = 6.0
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                     STREET FLOW DEPTH(FEET) = 0.55
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 20.27
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 45.78
   ***STREET FLOWING FULL***
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.17
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 2.51 Tc (MIN.) = 32.71
   STREET FLOW DEPTH(FEET) = 0.50
                                                                                    * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.396
   HALFSTREET FLOOD WIDTH (FEET) = 18.13
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.26
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
                                                                                        LAND USE
 STREET FLOW TRAVEL TIME (MIN.) = 2.64 Tc (MIN.) = 30.20
                                                                                    RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.464
                                                                                   "3-4 DWELLINGS/ACRE" B 0.78 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    RESIDENTIAL
                                                                                    "2 DWELLINGS/ACRE" B 12.66 0.75 0.700
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                  Αp
                                                         SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                                                                                    SUBAREA AREA(ACRES) = 13.44 SUBAREA RUNOFF(CFS) = 10.60
                                 2.71
                                          0.75
                                                  0.600 56
 RESIDENTIAL
                                                                                    EFFECTIVE AREA(ACRES) = 69.95 AREA-AVERAGED Fm(INCH/HR) = 0.54
 "2 DWELLINGS/ACRE"
                       B 6.04
                                          0.75
                                                  0.700
                                                        56
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 RESIDENTIAL
                                                                                    TOTAL AREA (ACRES) = 69.9 PEAK FLOW RATE (CFS) =
                                                0.900 56
 ".4 DWELLING/ACRE"
                       В
                               1.62
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
 SUBAREA AREA (ACRES) = 10.37 SUBAREA RUNOFF (CFS) = 8.74
 EFFECTIVE AREA(ACRES) = 56.51 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                                    DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.51
 TOTAL AREA(ACRES) = 56.5 PEAK FLOW RATE(CFS) =
                                                                                    FLOW VELOCITY (FEET/SEC.) = 5.88 DEPTH*VELOCITY (FT*FT/SEC.) = 3.24
                                                                                    LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20348.00 = 5333.01 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                  ********************
                                                                                    FLOW PROCESS FROM NODE 20348.00 TO NODE 20349.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.26
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 6.31 DEPTH*VELOCITY (FT*FT/SEC.) = 3.19
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20347.00 = 4458.51 FEET.
                                                                                  ______
                                                                                    UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1785.00
******************
                                                                                    STREET LENGTH (FEET) = 1082.38 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20347.00 TO NODE 20348.00 IS CODE = 63
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                    INSIDE STREET CROSSFALL (DECIMAL) = 0.020
_____
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00
 STREET LENGTH (FEET) = 874.50 CURB HEIGHT (INCHES) = 6.0
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
```

Page 33

Date: 04/21/2014

File name: LR0203ZZ.RES

Date: 04/21/2014 File name: LR0203ZZ.RES Page 34

52.02

SCS

56

53.84

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.48
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.22
 STREET FLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 34.98
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.341
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 33.09
                                        0.75
                                                0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.55 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.698
 SUBAREA AREA(ACRES) = 33.64
                               SUBAREA RUNOFF (CFS) = 24.78
 EFFECTIVE AREA(ACRES) = 103.59 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.71
 TOTAL AREA(ACRES) = 103.6 PEAK FLOW RATE(CFS) =
                                                         75.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.39
 FLOW VELOCITY (FEET/SEC.) = 8.30 DEPTH*VELOCITY (FT*FT/SEC.) = 4.55
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1082.4 FT WITH ELEVATION-DROP = 75.0 FT, IS 63.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20349.00
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20349.00 = 6415.39 FEET.
******************
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 34.98
 RAINFALL INTENSITY (INCH/HR) = 1.34
 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.71
 EFFECTIVE STREAM AREA(ACRES) = 103.59
 TOTAL STREAM AREA(ACRES) = 103.59
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 75.15
 ** CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          299.40 43.43 1.178 0.71(0.54)0.76 518.2 20300.00
    1
          234.82 58.16 0.988 0.71(0.54)0.76 567.5 20320.00
          75.15 34.98 1.341 0.75(0.53) 0.71
                                                103.6 20340.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 35

```
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 NUMBER
          374.55 34.98 1.341 0.71(0.54)0.75 521.0 20340.00
  1
          359.33 43.43 1.178 0.71 (0.54) 0.76 621.8 20300.00
          277.11 58.16 0.988 0.71(0.54)0.76 671.1 20320.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 374.55 Tc (MIN.) = 34.98
 EFFECTIVE AREA(ACRES) = 520.95 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 671.1
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
*************************
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.41;30M= 0.85;1H= 1.11;3H= 1.87;6H= 2.59;24H= 6.15
 S-GRAPH: VALLEY(DEV.) = 76.1%; VALLEY(UNDEV.)/DESERT= 23.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.54; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 671.1
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0600; Lca/L=0.4, n=.0538; Lca/L=0.5, n=.0494; Lca/L=0.6, n=.0461
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 171.70
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 577.60
 TOTAL PEAK FLOW RATE (CFS) = 577.60 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 374.55
 (UPSTREAM NODE PEAK FLOW RATE (CFS) = 374.55)
 PEAK FLOW RATE (CFS) USED = 577.60
******************
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20350.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1785.00 DOWNSTREAM ELEVATION(FEET) = 1715.00
 STREET LENGTH (FEET) = 1290.16 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 36

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 594.54
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.09
 HALFSTREET FLOOD WIDTH (FEET) = 47.55
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 12.94
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 14.11
STREET FLOW TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 45.09
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.151
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                   Дp
                                                            SCS
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 4.52 0.75
                                                    0.600
RESIDENTIAL
".4 DWELLING/ACRE" B 72.05
                                           0.75
                                                  0.900 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.882
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.89;6H= 2.61;24H= 6.18
S-GRAPH: VALLEY(DEV.) = 68.9%; VALLEY(UNDEV.) / DESERT = 31.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.55; Ybar = 0.54
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 747.7
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 12513.68 FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0633; Lca/L=0.4,n=.0567; Lca/L=0.5,n=.0521; Lca/L=0.6,n=.0486
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 188.78
UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 624.09
TOTAL AREA (ACRES) = 747.7 PEAK FLOW RATE (CFS) = 624.09
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.11 HALFSTREET FLOOD WIDTH(FEET) = 48.53
FLOW VELOCITY (FEET/SEC.) = 13.05 DEPTH*VELOCITY (FT*FT/SEC.) = 14.49
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 27.51
PIPE-FLOW(CFS) = 487.87
PIPEFLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 44.21
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.89;6H= 2.61;24H= 6.18
S-GRAPH: VALLEY(DEV.) = 68.9%; VALLEY(UNDEV.) / DESERT = 31.1%
```

```
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.55; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 747.7
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 13803.84 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0555; Lca/L=0.4, n=.0498; Lca/L=0.5, n=.0457; Lca/L=0.6, n=.0427
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 188.78
 TOTAL AREA (ACRES) = 747.7 PEAK FLOW RATE (CFS) = 626.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 138.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.21
*******************
 FLOW PROCESS FROM NODE 20350.00 TO NODE 20351.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1680.00
 STREET LENGTH (FEET) = 1342.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.28
   HALFSTREET FLOOD WIDTH (FEET) = 56.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.87
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.59
 STREET FLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 46.47
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.131
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.14 0.75 0.600
                                                          56
 RESIDENTIAL
```

Page 38

Date: 04/21/2014

```
".4 DWELLING/ACRE"
                    B 72.56 0.75 0.900 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.873
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.42;30M= 0.87;1H= 1.14;3H= 1.90;6H= 2.62;24H= 6.21
S-GRAPH: VALLEY(DEV.) = 63.2%; VALLEY(UNDEV.) / DESERT= 36.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.77; LAG(HR) = 0.62; Fm(INCH/HR) = 0.56; Ybar = 0.55
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 827.4
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 13803.84 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0599; Lca/L=0.4,n=.0537; Lca/L=0.5,n=.0493; Lca/L=0.6,n=.0460
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 206.75
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 676.12
TOTAL AREA (ACRES) = 827.4 PEAK FLOW RATE (CFS) = 676.12
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.30 HALFSTREET FLOOD WIDTH(FEET) = 57.87
FLOW VELOCITY (FEET/SEC.) = 9.99 DEPTH*VELOCITY (FT*FT/SEC.) = 12.96
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.03
PIPE-FLOW(CFS) = 500.07
PIPEFLOW TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 45.27
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.42;30M= 0.87;1H= 1.14;3H= 1.90;6H= 2.62;24H= 6.21
S-GRAPH: VALLEY(DEV.) = 63.2%; VALLEY(UNDEV.) / DESERT = 36.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.74; LAG(HR) = 0.59; Fm(INCH/HR) = 0.56; Ybar = 0.55
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 827.4
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 15145.87 FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0522; Lca/L=0.4,n=.0468; Lca/L=0.5,n=.0430; Lca/L=0.6,n=.0401
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 206.75
TOTAL AREA (ACRES) = 827.4
                                  PEAK FLOW RATE (CFS) = 681.04
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 180.97
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.83
 HALFSTREET FLOOD WIDTH (FEET) = 34.37
```

```
PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 6.15
FLOW PROCESS FROM NODE 20351.00 TO NODE 20352.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1680.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 1091.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.33
   HALFSTREET FLOOD WIDTH (FEET) = 59.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.50
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 12.68
 STREET FLOW TRAVEL TIME (MIN.) = 1.91 Tc (MIN.) = 47.19
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.120
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                          SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 15.77
                                          0.75 0.900
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.71 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.887
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.42;30M= 0.87;1H= 1.14;3H= 1.90;6H= 2.63;24H= 6.22
 S-GRAPH: VALLEY(DEV.) = 62.0%; VALLEY(UNDEV.)/DESERT= 38.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.79; LAG(HR) = 0.63; Fm(INCH/HR) = 0.56; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 843.8
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 15145.87 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0559; Lca/L=0.4,n=.0502; Lca/L=0.5,n=.0461; Lca/L=0.6,n=.0430
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 210.38
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 683.54
 TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) =
                                                           683.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Page 40

AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.43

Date: 04/21/2014

```
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.33 HALFSTREET FLOOD WIDTH(FEET) = 59.64
 FLOW VELOCITY (FEET/SEC.) = 9.51 DEPTH*VELOCITY (FT*FT/SEC.) = 12.68
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.31
 PIPE-FLOW(CFS) = 527.74
 PIPEFLOW TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 46.17
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.42;30M= 0.87;1H= 1.14;3H= 1.90;6H= 2.63;24H= 6.22
 S-GRAPH: VALLEY(DEV.) = 62.0%; VALLEY(UNDEV.) / DESERT = 38.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.56; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 843.8
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0502; Lca/L=0.4,n=.0450; Lca/L=0.5,n=.0414; Lca/L=0.6,n=.0386
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 210.38
 TOTAL AREA(ACRES) = 843.8
                                PEAK FLOW RATE (CFS) = 689.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 161.36
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 33.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.60
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
*****************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1957.45 Tc (MIN.) = 41.19
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.59
 TOTAL AREA (ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
```

```
FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1957.45 Tc (MIN.) = 41.19
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.59
 TOTAL AREA(ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
******************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
FLOW PROCESS FROM NODE 20274.00 TO NODE 20352.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1670.00 DOWNSTREAM(FEET) = 1655.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 623.43 CHANNEL SLOPE = 0.0241
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1957.45
 FLOW VELOCITY (FEET/SEC.) = 28.42 FLOW DEPTH (FEET) = 3.88
 TRAVEL TIME (MIN.) = 0.37 Tc (MIN.) = 41.55
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
*************************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 41.55
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.209
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                          Αp
                                               SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                     В
                         10.49
                                  0.75
                                         0.600
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В 1.59
                                  0.75
                                         0.600
                                                56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   В
                         21.45
                                  0.75
                                         0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.792
 SUBAREA AREA (ACRES) = 33.53
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.01;3H= 1.82;6H= 2.65;24H= 5.85
 S-GRAPH: VALLEY(DEV.) = 35.0%; VALLEY(UNDEV.) / DESERT = 65.0%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.59; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
```

Page 42

Date: 04/21/2014

\*

```
DEPTH-AREA FACTORS: 5M = 0.86; 30M = 0.86; 1HR = 0.86;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3135.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0411; Lca/L=0.4,n=.0368; Lca/L=0.5,n=.0338; Lca/L=0.6,n=.0316
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 660.62
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1963.74
 TOTAL AREA (ACRES) = 3135.5 PEAK FLOW RATE (CFS) = 1963.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 11
......
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1963.74 Tc (MIN.) = 41.55
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.59
 TOTAL AREA (ACRES) = 3135.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 689.10 Tc (MIN.) = 46.17
 AREA-AVERAGED Fm (INCH/HR) = 0.56 Ybar = 0.55
 TOTAL AREA (ACRES) = 843.8
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.79;1H= 1.04;3H= 1.84;6H= 2.65;24H= 5.93
 S-GRAPH: VALLEY(DEV.) = 40.8%; VALLEY(UNDEV.) / DESERT = 59.2%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3979.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0411; Lca/L=0.4,n=.0368; Lca/L=0.5,n=.0338; Lca/L=0.6,n=.0316
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 860.54
 PEAK FLOW RATE (CFS) = 2484.29
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20353.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1655.00 DOWNSTREAM(FEET) = 1625.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1454.79 CHANNEL SLOPE = 0.0206
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 2484.29
 FLOW VELOCITY (FEET/SEC.) = 28.40 FLOW DEPTH (FEET) = 4.26
 TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 42.41
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET.
******************
 FLOW PROCESS FROM NODE 20353.00 TO NODE 20353.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 42.41
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.195
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                                     SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                              20.64
                                       0.75
                                              0.600
                                                      56
                       R
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                             1.09
                                       0.75
                                              0.600
                                                      56
 RESIDENTIAL.
 ".4 DWELLING/ACRE"
                       B 25.75
                                       0.75
                                              0.900
                                                      56
 NATURAL FAIR COVER
                              2.69
 "OPEN BRUSH"
                       В
                                       0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
 SUBAREA AREA(ACRES) = 50.17
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.79;1H= 1.04;3H= 1.84;6H= 2.64;24H= 5.93
 S-GRAPH: VALLEY(DEV.) = 40.8%; VALLEY(UNDEV.)/DESERT= 59.2%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4029.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0394; Lca/L=0.4, n=.0353; Lca/L=0.5, n=.0324; Lca/L=0.6, n=.0303
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 870.06
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2470.96
                               PEAK FLOW RATE (CFS) = 2484.29
 TOTAL AREA (ACRES) = 4029.5
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20353.00 TO NODE 20376.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1600.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1369.05 CHANNEL SLOPE = 0.0183
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 43

File name: LR020377.RFS

Date: 04/21/2014

```
CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 2484.29
 FLOW VELOCITY (FEET/SEC.) = 27.15 FLOW DEPTH (FEET) = 4.40
 TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 43.25
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
*****************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 43.25
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.181
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                    Fρ
                                              Αp
                                                      SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                      В
                              13.67
                                        0.75
                                               0.250
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.97
                                        0.75
                                               0.600
                                                       56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                             5.87
                                        0.75
                                               0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.523
 SUBAREA AREA(ACRES) = 39.51
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.79;1H= 1.04;3H= 1.84;6H= 2.64;24H= 5.92
 S-GRAPH: VALLEY(DEV.) = 41.2%; VALLEY(UNDEV.) / DESERT = 58.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4069.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0380; Lca/L=0.4, n=.0341; Lca/L=0.5, n=.0313; Lca/L=0.6, n=.0292
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 880.69
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2453.70
 TOTAL AREA(ACRES) = 4069.0
                                PEAK FLOW RATE (CFS) = 2484.29
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
********************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 2484.29 Tc (MIN.) = 43.25
 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.58
 TOTAL AREA (ACRES) = 4069.0
******************
 FLOW PROCESS FROM NODE 20360.00 TO NODE 20361.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 985.35
 ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2160.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.078
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.538
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              6.63
                                      0.75 0.700
                                                     56 12.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 12.02
 TOTAL AREA (ACRES) = 6.63 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
*************************
 FLOW PROCESS FROM NODE 20361.00 TO NODE 20362.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2130.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.55 CHANNEL SLOPE = 0.0586
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              12.02
 FLOW VELOCITY (FEET/SEC.) = 2.38 FLOW DEPTH (FEET) = 0.32
 TRAVEL TIME (MIN.) = 3.58 Tc (MIN.) = 15.66
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20362.00 = 1496.90 FEET.
******************
 FLOW PROCESS FROM NODE 20362.00 TO NODE 20362.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.66
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.172
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αp
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            5.52
                                      0.75
                                              0.700
                                                     56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                              0.40
                                      0.75
                                              0.600
                                                     56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              3.20
                                      0.61
                                             1.000
                                                     66
 RESIDENTIAL
                              3.04
                                      0.75
                                             0.400
                                                     56
 "8-10 DWELLINGS/ACRE"
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
```

Page 46

Date: 04/21/2014

```
SUBAREA AREA(ACRES) = 12.16
                             SUBAREA RUNOFF (CFS) = 18.42
 EFFECTIVE AREA(ACRES) = 18.79 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 18.8
                            PEAK FLOW RATE(CFS) =
                                                    28.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
*******************
 FLOW PROCESS FROM NODE 20362.00 TO NODE 20363.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2130.00 DOWNSTREAM(FEET) = 2110.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 490.89 CHANNEL SLOPE = 0.0407
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 40.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              28.26
 FLOW VELOCITY (FEET/SEC.) = 2.67 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 3.06 Tc (MIN.) = 18.72
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20363.00 = 1987.79 FEET.
******************
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20363.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 18.72
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.951
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                                            Ар
                                                   SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             2.09
                                      0.75
                                             0.600
                                                   56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                             5.13
                                      0.75
                                             0.700
                                                   56
                      В
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              0.30
                                      0.61
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA(ACRES) = 7.52
                             SUBAREA RUNOFF (CFS) = 9.78
 EFFECTIVE AREA(ACRES) = 26.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 26.3
                            PEAK FLOW RATE(CFS) =
                                                    34.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20364.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2100.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 560.20 CHANNEL SLOPE = 0.0179
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
```

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             34.31
 FLOW VELOCITY (FEET/SEC.) = 1.96 FLOW DEPTH (FEET) = 0.59
 TRAVEL TIME (MIN.) = 4.77 Tc (MIN.) = 23.49
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20364.00 = 2547.99 FEET.
********************
 FLOW PROCESS FROM NODE 20364.00 TO NODE 20364.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 23.49
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.703
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                                SCS
                                          Αр
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В
                          10.47
                                   0.75 0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.47 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA(ACRES) = 11.94
                           SUBAREA RUNOFF (CFS) = 12.77
 EFFECTIVE AREA(ACRES) = 38.25 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 38.2
                            PEAK FLOW RATE(CFS) =
                                              41.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20364.00 TO NODE 20365.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2090.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 586.56 CHANNEL SLOPE = 0.0170
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 41.19
 FLOW VELOCITY (FEET/SEC.) = 2.02 FLOW DEPTH (FEET) = 0.64
 TRAVEL TIME (MIN.) = 4.83 Tc (MIN.) = 28.32
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20365.00 = 3134.55 FEET.
*******************
 FLOW PROCESS FROM NODE 20365.00 TO NODE 20365.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 28.32
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.522
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                Fр
                                         Ар
                                                SCS
   LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  B 0.95 0.75
                                          0.600
                                               56
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 47

Date: 04/21/2014 File name: LR0203ZZ.RES

```
"2 DWELLINGS/ACRE"
                   B 11.94 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA(ACRES) = 12.89 SUBAREA RUNOFF(CFS) = 11.65
 EFFECTIVE AREA(ACRES) = 51.14 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 51.1 PEAK FLOW RATE (CFS) = 46.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
*****************
 FLOW PROCESS FROM NODE 20365.00 TO NODE 20366.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2090.00 DOWNSTREAM(FEET) = 2055.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 592.61 CHANNEL SLOPE = 0.0591
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 46.61
 FLOW VELOCITY (FEET/SEC.) = 3.30 FLOW DEPTH (FEET) = 0.53
 TRAVEL TIME (MIN.) = 2.99 Tc (MIN.) = 31.31
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20366.00 = 3727.16 FEET.
FLOW PROCESS FROM NODE 20366.00 TO NODE 20366.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 31.31
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.433
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Ар
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.40
                                   0.75
                                          0.600
                                                56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   в 7.97
                                   0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA AREA(ACRES) = 8.37 SUBAREA RUNOFF(CFS) = 6.88
 EFFECTIVE AREA(ACRES) = 59.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 59.5 PEAK FLOW RATE(CFS) =
                                                 49 40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20366.00 TO NODE 20367.00 IS CODE = 54
...........
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2040.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 831.01 CHANNEL SLOPE = 0.0181
      Date: 04/21/2014
```

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           49.40
 FLOW VELOCITY (FEET/SEC.) = 2.16 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 6.41 Tc (MIN.) = 37.72
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20367.00 = 4558.17 FEET.
******************
 FLOW PROCESS FROM NODE 20367.00 TO NODE 20367.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 37.72
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.282
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                         Ар
                                                SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 40.07
                                   0.75
                                          0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.44 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA(ACRES) = 44.51 SUBAREA RUNOFF(CFS) = 30.66
 EFFECTIVE AREA(ACRES) = 104.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 104.0
                            PEAK FLOW RATE(CFS) =
                                                 71.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20367.00 TO NODE 20368.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2040.00 DOWNSTREAM(FEET) = 1970.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 949.68 CHANNEL SLOPE = 0.0737
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 71.94
 FLOW VELOCITY (FEET/SEC.) = 4.02 FLOW DEPTH (FEET) = 0.60
 TRAVEL TIME (MIN.) = 3.93 Tc (MIN.) = 41.65
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20368.00 = 5507.85 FEET.
******************
 FLOW PROCESS FROM NODE 20368.00 TO NODE 20368.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 41.65
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.208
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                          αA
                                                SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                           15.48
                                   0.75
                                          0.700
```

Page 49 File name: LR020377.RFS

Date: 04/21/2014 File name: LR0203ZZ.RES

```
RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.21 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.703
 SUBAREA AREA (ACRES) = 15.69 SUBAREA RUNOFF (CFS) = 9.63
 EFFECTIVE AREA(ACRES) = 119.71 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 119.7
                           PEAK FLOW RATE(CFS) =
                                                 74.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
*****
 FLOW PROCESS FROM NODE 20368.00 TO NODE 20369.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1900.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 892.15 CHANNEL SLOPE = 0.0785
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 74.64
 FLOW VELOCITY (FEET/SEC.) = 4.15 FLOW DEPTH (FEET) = 0.60
 TRAVEL TIME (MIN.) = 3.58 Tc (MIN.) = 45.24
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20369.00 = 6400.00 FEET.
******************
 FLOW PROCESS FROM NODE 20369.00 TO NODE 20369.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 45.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.149
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                 SCS
                                          αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 29.59
                                    0.75
                                           0.700
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.11
                                   0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
 SUBAREA AREA(ACRES) = 29.70
                           SUBAREA RUNOFF(CFS) = 16.71
 EFFECTIVE AREA(ACRES) = 149.41 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 149.4 PEAK FLOW RATE(CFS) =
                                                  85.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
FLOW PROCESS FROM NODE 20369.00 TO NODE 20370.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1860.00
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 949.40 CHANNEL SLOPE = 0.0421
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              85.06
 FLOW VELOCITY (FEET/SEC.) = 3.41 FLOW DEPTH (FEET) = 0.71
 TRAVEL TIME (MIN.) = 4.64 Tc (MIN.) = 49.88
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20370.00 = 7349.40 FEET.
******************
 FLOW PROCESS FROM NODE 20370.00 TO NODE 20370.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 49.88
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.084
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                Αр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 9.75
                                        0.75
                                               0.900
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.37
                                        0.75
                                               0.600
                                                       56
 RESIDENTIAL
                      в 7.31
 "2 DWELLINGS/ACRE"
                                        0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810
 SUBAREA AREA(ACRES) = 17.43
                               SUBAREA RUNOFF (CFS) = 7.50
 EFFECTIVE AREA(ACRES) = 166.84 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
 TOTAL AREA(ACRES) = 166.8 PEAK FLOW RATE(CFS) =
                                                       85.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
******************
 FLOW PROCESS FROM NODE 20370.00 TO NODE 20371.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1845.00
 STREET LENGTH (FEET) = 771.36 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  86.44
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 51

Date: 04/21/2014

File name: LR0203ZZ.RES

```
STREET FLOW DEPTH (FEET) = 0.68
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.38 Tc (MIN.) = 53.58
   HALFSTREET FLOOD WIDTH (FEET) = 27.23
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.038
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.55
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.80
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
 STREET FLOW TRAVEL TIME (MIN.) = 2.31 Tc (MIN.) = 52.19
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.055
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 3.05 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                 Αp
                                                                                  RESIDENTIAL
                                                                                  "2 DWELLINGS/ACRE" B 36.06 0.75 0.700 56
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" B 1.23
                                                       56
                                         0.75
                                                 0.600
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
                                                                                  SUBAREA AREA (ACRES) = 39.11 SUBAREA RUNOFF (CFS) = 18.32
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.24
                                         0.75
                                                 0.900
                                                                                  EFFECTIVE AREA(ACRES) = 211.60 AREA-AVERAGED Fm(INCH/HR) = 0.52
 RESIDENTIAL
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 "2 DWELLINGS/ACRE" B 4.18
                                         0.75 0.700 56
                                                                                  TOTAL AREA (ACRES) = 211.6 PEAK FLOW RATE (CFS) =
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 5.65 SUBAREA RUNOFF (CFS) = 2.75
                                                                                  5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50
 EFFECTIVE AREA(ACRES) = 172.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 172.5 PEAK FLOW RATE (CFS) =
                                                       85.06
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.05
 FLOW VELOCITY(FEET/SEC.) = 5.54 DEPTH*VELOCITY(FT*FT/SEC.) = 3.77
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20371.00 = 8120.76 FEET.
*****
                                                                                  >>>> (STREET TABLE SECTION # 18 USED) <<<<
 FLOW PROCESS FROM NODE 20371.00 TO NODE 20372.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 26.00
_____
 UPSTREAM ELEVATION (FEET) = 1845.00 DOWNSTREAM ELEVATION (FEET) = 1825.00
 STREET LENGTH (FEET) = 580.50 CURB HEIGHT (INCHES) = 6.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                   STREET FLOW DEPTH(FEET) = 0.71
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 27.95
   ***STREET FLOWING FULL***
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.34
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.01
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.51
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
```

DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.58 FLOW VELOCITY (FEET/SEC.) = 7.08 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.62 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS. AND L = 580.5 FT WITH ELEVATION-DROP = 20.0 FT, IS 80.0 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20372.00 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20372.00 = 8701.26 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20372.00 TO NODE 20373.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1825.00 DOWNSTREAM ELEVATION(FEET) = 1770.00 STREET LENGTH (FEET) = 1298.78 CURB HEIGHT (INCHES) = 8.0 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 112.98 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 5.18 STREET FLOW TRAVEL TIME (MIN.) = 2.95 Tc (MIN.) = 56.53 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.005 SCS Date: 04/21/2014 File name: LR0203ZZ.RES Page 54

SCS

97.91

LAND USE RESIDENTIAL	GROUP		(INCH/HR)	(DECIMAL)		"3-4 DWELLINGS/ACRE" RESIDENTIAL			0.75	0.600	56
"3-4 DWELLINGS/ACRE" RESIDENTIAL	В	6.56	0.75	0.600	56	".4 DWELLING/ACRE" SUBAREA AVERAGE PERVIO	US LOSS RATI		H/HR) = 0	0.900 .75	56
".4 DWELLING/ACRE" RESIDENTIAL	В	75.29	0.75	0.900	56	SUBAREA AVERAGE PERVIO SUBAREA AREA(ACRES) =				s) = 23.	.09
"2 DWELLINGS/ACRE"			0.75	0.700	56	EFFECTIVE AREA(ACRES)					= 0.58
SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU				.75		AREA-AVERAGED Fp(INCH/ TOTAL AREA(ACRES) =					136.53
SUBAREA AREA (ACRES) =								DMII (TNOII)			
EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H					= 0.36	SUBAREA AREA-AVERAGED : 5M = 0.46; 30M = 0.95;				2.75; 24H	4R = 6.24
TOTAL AREA (ACRES) =	303.4	PEAK	K FLOW RATE	(CFS) =	121.74						
SUBAREA AREA-AVERAGED R	RAINFALL DE	PTH(INCH)	:			END OF SUBAREA STREET DEPTH(FEET) = 0.75 H.			H(FEET) =	30.27	
5M = 0.46; 30M = 0.94;	1HR = 1.24	; 3HR = 2	2.02; 6HR =	2.75; 24HF	R = 6.09	FLOW VELOCITY (FEET/SEC *NOTE: INITIAL SUBAREA					= 5.67
END OF SUBAREA STREET F DEPTH(FEET) = 0.72 HA			ui/BEEM\ -	20 62		AND L = 1333.5 WHICH EXCEEDS T					
FLOW VELOCITY (FEET/SEC.	.) = 7.53	DEPTH*V	ELOCITY (FT	*FT/SEC.) =	5.42	LONGEST FLOWPATH FROM					
*NOTE: INITIAL SUBAREA AND L = 1298.8 F					11.9 CFS,	*******	*****	*****	*****	*****	*****
WHICH EXCEEDS TH	HE TOP-OF-C	URB STREE	T CAPACITY	AT NODE 2	20373.00	FLOW PROCESS FROM NODE					
						>>>>COMPUTE STREET FL				<<	
**************************************						>>>> (STREET TABLE SEC		,			=========
>>>>COMPUTE STREET FLC	OW TRAVEL T	IME THRU	SUBAREA<<			UPSTREAM ELEVATION(FEE STREET LENGTH(FEET) = STREET HALFWIDTH(FEET)	1282.17			. ,	= 1660.00
										4.5.00	
UPSTREAM ELEVATION (FEET STREET LENGTH (FEET) = STREET HALFWIDTH (FEET)	1333.48			, ,	= 1/20.00	DISTANCE FROM CROWN TO INSIDE STREET CROSSFAL OUTSIDE STREET CROSSFA	L(DECIMAL) =	= 0.020	,	15.00	
DISTANCE FROM CROWN TO	CROSSFALL	GRADEBREA	K(FEET) =	15.00		SPECIFIED NUMBER OF HA	LESTREETS C	ARRYING RI	INOFF = 2		
INSIDE STREET CROSSFALL	L(DECIMAL)	= 0.020				STREET PARKWAY CROSSFA	LL(DECIMAL)	= 0.020	0		
OUTSIDE STREET CROSSFAL	LL(DECIMAL)	= 0.02	20			Manning's FRICTION FAC Manning's FRICTION FAC					
SPECIFIED NUMBER OF HAL STREET PARKWAY CROSSFAL						MAXIMUM ALLOWABLE STRE					
Manning's FRICTION FACT						**TRAVEL TIME COMPUT		TIMATED F	LOW(CFS) =	147.2	21
Manning's FRICTION FACT MAXIMUM ALLOWABLE STREE				ion = 0.0	J200	***STREET FLOWING FU STREETFLOW MODEL RES		ESTIMATED	FLOW:		
++EDAVIDA ETVE CONDUE			T 011 (070)	122 20		STREET FLOW DEPTH (FE	•				
**TRAVEL TIME COMPUTE  ***STREET FLOWING FUL		TIMATED F	LOW(CFS) =	133.30	J	HALFSTREET FLOOD WID AVERAGE FLOW VELOCIT			33		
STREETFLOW MODEL RESU			FLOW:			PRODUCT OF DEPTH&VEL				60.06	
STREET FLOW DEPTH(FEE HALFSTREET FLOOD WIDT						STREET FLOW TRAVEL TIM * 25 YEAR RAINFALL IN				62.06	
AVERAGE FLOW VELOCITY			48			SUBAREA LOSS RATE DATA		11/1111/	0.331		
PRODUCT OF DEPTH&VELO	,					DEVELOPMENT TYPE/	SCS SOIL		Fp	Ар	SCS
STREET FLOW TRAVEL TIME				59.50		LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
* 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(		n/nk) =	0.313			RESIDENTIAL "3-4 DWELLINGS/ACRE"	В	8.27	0.75	0.600	56
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Аp	SCS	RESIDENTIAL	•				
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	".4 DWELLING/ACRE"	В	70.54	0.75	0.900	56
RESIDENTIAL						SUBAREA AVERAGE PERVIO	us Loss RATI	E, Fp(INC	H/HR) = 0	. /5	

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 56

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.869
 SUBAREA AREA (ACRES) = 78.81 SUBAREA RUNOFF (CFS) = 21.34
 EFFECTIVE AREA(ACRES) = 462.27 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 462.3 PEAK FLOW RATE (CFS) = 149.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.45
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.09
 FLOW VELOCITY (FEET/SEC.) = 8.36 DEPTH*VELOCITY (FT*FT/SEC.) = 6.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1282.2 FT WITH ELEVATION-DROP = 60.0 FT, IS 123.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20375.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20375.00 = 12615.69 FEET.
*************************
 FLOW PROCESS FROM NODE 20375.00 TO NODE 20376.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1660.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1887.14 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 23.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.07
 PIPE-FLOW(CFS) = 149.46
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 63.64
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.936
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS
                                                  αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.76
                                         0.75
                                                 0.600
                                                       56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 79.51
                                         0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845
                               SUBAREA RUNOFF(CFS) = 26.62
 SUBAREA AREA(ACRES) = 97.27
 EFFECTIVE AREA(ACRES) = 559.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 559.5 PEAK FLOW RATE(CFS) =
                                                      170.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.70; 6HR = 2.43; 24HR = 5.53
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 20.68
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.46
  HALFSTREET FLOOD WIDTH (FEET) = 14.96
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.26
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.95
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20376.00 = 14502.83 FEET.
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 63.64
 RAINFALL INTENSITY (INCH/HR) = 0.94
 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.80
 EFFECTIVE STREAM AREA(ACRES) = 559.54
 TOTAL STREAM AREA(ACRES) = 559.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 170.15
 ** CONFLUENCE DATA **
 STREAM O TC
                       AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                 NODE
  1 2484.29 43.25 4068.99 20120.00
   2 170.15 63.64 559.54 20360.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.79;1H= 1.05;3H= 1.84;6H= 2.64;24H= 5.91
 S-GRAPH: VALLEY(DEV.) = 41.6%; VALLEY(UNDEV.) / DESERT = 58.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.58; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0380; Lca/L=0.4, n=.0341; Lca/L=0.5, n=.0313; Lca/L=0.6, n=.0292
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 991.36
 PEAK FLOW RATE (CFS) = 2727.15
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
 END OF STUDY SUMMARY:
```

Page 58

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014

TOTAL AREA (ACRES) = 4628.5 TC (MIN.) = 43.25 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.59 PEAK FLOW RATE (CFS) = 2727.15

-----

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0203ZZ.RES
 Page 59
 Date: 04/21/2014
 File name: LR0203ZZ.RES
 Page 60

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20454

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0204ZZ.DAT

11

12

13

14

15

16

24.0

24.0

32.0

39.0

36.0

12.5

15.0

15.0

20.0

20.0

20.0

5.0

Date: 04/21/2014

TIME/DATE OF STUDY: 15:55 10/25/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9700

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 0.67 10.0 15.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 9 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67

0.50

0.67

0.67

0.67

0.67

1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

Page 1

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020 0.50

File name: LR0204ZZ.RES

as (Maximum Allowa 2. (Depth)*(Velocity) *SIZE PIPE WITH A FLOW OR EQUAL TO THE UPSTRE *USER-SPECIFIED MINIMUM	ble Street Flow D Constraint = 6. CAPACITY GREATER AM TRIBUTARY PIPE	O (FT*FT/S) THAN .*		ΓED		
UNIT-HYDROGRAPH MODEL S WATERSHED LAG = 0.80 USED "VALLEY UNDEVELO 1 UNITS/ACRE AND LESS FOR DEVELOPMENTS OF 2 PRECIPITATION DATA EN SIERRA MADRE DEPTH-AR *ANTECEDENT MOISTURE CON	* Tc PED" S-GRAPH FOR F; AND "VALLEY DEV UNITS/ACRE AND M ITERED ON SUBAREA REA FACTORS USED. IDITION (AMC) II A	DEVELOPMENTS ELOPED" S-GF ORE. BASIS. SSUMED FOR U	NAPH			
******************************** FLOW PROCESS FROM NODE	20400.00 TO NODE	20401.00 I	S CODE = 2	21		
>>>>RATIONAL METHOD IN >>USE TIME-OF-CONCENTRA	TION NOMOGRAPH FO	R INITIAL SU				
INITIAL SUBAREA FLOW-LE ELEVATION DATA: UPSTREA	NGTH (FEET) = 92	4.07				
Tc = K*[(LENGTH** 3.00) SUBAREA ANALYSIS USED M * 25 YEAR RAINFALL INT SUBAREA TC AND LOSS RAT DEVELOPMENT TYPE/ LAND USE	IINIMUM Tc(MIN.) = PENSITY(INCH/HR) = PE DATA(AMC II): SCS SOIL AREA	11.338 2.636	Ap (DECIMAL)	SCS CN	Tc (MIN.)	
RESIDENTIAL ".4 DWELLING/ACRE" RESIDENTIAL	в 0.14	0.75	0.900	56	13.40	
"3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA RUNOFF (CFS) = TOTAL AREA (ACRES) =	S LOSS RATE, Fp(I S AREA FRACTION, 20.46	NCH/HR) = 0 Ap = 0.604	.75		11.34	
SUBAREA AREA-AVERAGED R 5M = 0.36; 30M = 0.74;			2.27; 24HF	R = 4	.72	
**************************************						
>>>>COMPUTE STREET FLC	OW TRAVEL TIME THE	U SUBAREA<<<	<<			
UPSTREAM ELEVATION (FEET STREET LENGTH (FEET) = STREET HALFWIDTH (FEET)	2) = 1670.00 DOWN 293.15 CURB HE	STREAM ELEVA	TION (FEET)			
Date: 04/21/2014	File name: LR0204	ZZ.RES		Page 2		

0.020/0.020/0.020 0.50

0.020/0.020/0.020 0.67

0.67

0.020/0.020/0.020

1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

17 20.0

19 52.0

26.0

18

10.0

15.0

20.0

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.20 FEET

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.16
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.34
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 12.28
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.513
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                qД
                                                         SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 0.06 0.75 0.900 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.48 0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.602
 SUBAREA AREA(ACRES) = 8.54 SUBAREA RUNOFF(CFS) = 15.85
 EFFECTIVE AREA(ACRES) = 18.95 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 19.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.57
 FLOW VELOCITY (FEET/SEC.) = 5.49 DEPTH*VELOCITY (FT*FT/SEC.) = 2.62
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20402.00 = 1217.22 FEET.
******************
 FLOW PROCESS FROM NODE 20402.00 TO NODE 20403.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1657.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 198.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.59
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.59
   HALFSTREET FLOOD WIDTH (FEET) = 22.47
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.47
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.05
 STREET FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 13.23
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.403
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.76 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 2.76 SUBAREA RUNOFF (CFS) = 4.85
 EFFECTIVE AREA(ACRES) = 21.71 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) =
                                                           38.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.59
 FLOW VELOCITY (FEET/SEC.) = 3.49 DEPTH*VELOCITY (FT*FT/SEC.) = 2.06
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20403.00 = 1415.72 FEET.
******************
 FLOW PROCESS FROM NODE 20403.00 TO NODE 20404.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1645.00
 STREET LENGTH (FEET) = 470.13 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     44.95
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.73
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 4

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.64
 STREET FLOW TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 14.89
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.239
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.38
                                        0.75
                                                0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.08 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 8.46 SUBAREA RUNOFF (CFS) = 13.61
 EFFECTIVE AREA(ACRES) = 30.17 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 30.2 PEAK FLOW RATE (CFS) = 48.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.55
 FLOW VELOCITY (FEET/SEC.) = 4.84 DEPTH*VELOCITY (FT*FT/SEC.) = 2.77
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20404.00 = 1885.85 FEET.
******************
 FLOW PROCESS FROM NODE 20404.00 TO NODE 20405.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1645.00 DOWNSTREAM ELEVATION(FEET) = 1635.00
 STREET LENGTH (FEET) = 344.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 56.09
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.22
 STREET FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 15.90
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.152
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"3-4 DWELLINGS/ACRE" B 9.77 0.75 0.600
                                                          56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.09 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 9.86 SUBAREA RUNOFF (CFS) = 15.09
 EFFECTIVE AREA(ACRES) = 40.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 40.0 PEAK FLOW RATE (CFS) = 61.28
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.56
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
 FLOW VELOCITY (FEET/SEC.) = 5.80 DEPTH*VELOCITY (FT*FT/SEC.) = 3.39
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20405.00 = 2230.11 FEET.
******************
 FLOW PROCESS FROM NODE 20405.00 TO NODE 20406.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
>>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1635.00 DOWNSTREAM ELEVATION(FEET) = 1620.00
 STREET LENGTH (FEET) = 701.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 STREET FLOW TRAVEL TIME (MIN.) = 2.29 Tc (MIN.) = 18.19
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.985
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 20.00 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 20.00 SUBAREA RUNOFF (CFS) = 27.65
 EFFECTIVE AREA(ACRES) = 60.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 60.0 PEAK FLOW RATE (CFS) = 82.91
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 6

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.19
 FLOW VELOCITY (FEET/SEC.) = 5.29 DEPTH*VELOCITY (FT*FT/SEC.) = 3.76
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20406.00 = 2931.13 FEET.
********************
 FLOW PROCESS FROM NODE 20406.00 TO NODE 20407.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1620.00 DOWNSTREAM ELEVATION(FEET) = 1612.00
 STREET LENGTH (FEET) = 570.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.02
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.57
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.67
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 STREET FLOW TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 20.23
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.863
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.31 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.31 SUBAREA RUNOFF (CFS) = 6.76
 EFFECTIVE AREA(ACRES) = 65.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 65.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.21
 FLOW VELOCITY (FEET/SEC.) = 4.61 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20407.00 = 3501.13 FEET.
```

```
FLOW PROCESS FROM NODE 20407.00 TO NODE 20408.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1612.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 804.76 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 96.48
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 28.44
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 STREET FLOW TRAVEL TIME (MIN.) = 2.22 Tc (MIN.) = 22.44
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.750
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 22.89 0.75 0.600
                                                     56
 COMMERCIAL
                     B 0.02 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 22.91 SUBAREA RUNOFF(CFS) = 26.83
 EFFECTIVE AREA(ACRES) = 88.25 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 88.2 PEAK FLOW RATE (CFS) = 103.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.11
 FLOW VELOCITY (FEET/SEC.) = 6.17 DEPTH*VELOCITY (FT*FT/SEC.) = 4.50
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20408.00 = 4305.89 FEET.
******************
 FLOW PROCESS FROM NODE 20408.00 TO NODE 20409.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH (FEET) = 498.42 CURB HEIGHT (INCHES) = 8.0
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 8

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

```
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 124.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 29.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.44
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20409.00 = 4804.31 FEET.
******************
 FLOW PROCESS FROM NODE 20409.00 TO NODE 20410.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1533.00
 STREET LENGTH (FEET) = 1374.92 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 193.48
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.13
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.50
 STREET FLOW TRAVEL TIME (MIN.) = 3.07 Tc (MIN.) = 26.14
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.597
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 0.01 0.61 1.000
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 52.45 0.75 0.600
                                                          56
                              0.03 0.75 0.850 56
 PUBLIC PARK
                       B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 52.49 SUBAREA RUNOFF (CFS) = 54.24
 EFFECTIVE AREA(ACRES) = 196.68 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 196.7 PEAK FLOW RATE (CFS) = 204.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

Page 10

Date: 04/21/2014

Date: 04/21/2014 File name: LR0204ZZ.RES Page 9

TOTAL AREA(ACRES) = 144.2 PEAK FLOW RATE(CFS) = 166.34

5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 36.80
 FLOW VELOCITY (FEET/SEC.) = 7.61 DEPTH*VELOCITY (FT*FT/SEC.) = 6.72
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.77
 PIPE-FLOW(CFS) = 46.83
 PIPEFLOW TRAVEL TIME (MIN.) = 1.95 Tc (MIN.) = 25.02
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.640
 SUBAREA AREA (ACRES) = 52.49 SUBAREA RUNOFF (CFS) = 56.24
 TOTAL AREA(ACRES) = 196.7 PEAK FLOW RATE(CFS) = 211.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 165.15
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.83
  HALFSTREET FLOOD WIDTH (FEET) = 34.18
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.14
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.93
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
*******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
*************************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2727.15 Tc (MIN.) = 43.25
 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.59
 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2727.15 Tc (MIN.) = 43.25
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.59
 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
```

```
FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20410.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1533.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2846.26 CHANNEL SLOPE = 0.0235
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 2727.15
 FLOW VELOCITY (FEET/SEC.) = 30.56 FLOW DEPTH (FEET) = 4.32
 TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 44.80
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
*******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 44.80
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.156
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                          25.52
                                     0.75
                                             0.600
 PUBLIC PARK
                     В
                            5.30
                                     0.75
                                            0.850
                                                    56
                             8.19
                                            0.600
                                                    56
 SCHOOL
                      В
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA(ACRES) = 39.01
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.79;1H= 1.05;3H= 1.84;6H= 2.63;24H= 5.90
 S-GRAPH: VALLEY(DEV.) = 42.1%; VALLEY(UNDEV.) / DESERT = 57.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0355; Lca/L=0.4,n=.0318; Lca/L=0.5,n=.0292; Lca/L=0.6,n=.0273
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 998.72
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2676.93
 TOTAL AREA (ACRES) = 4667.5 PEAK FLOW RATE (CFS) = 2727.15
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.72
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Date: 04/21/2014 File name: LR0204ZZ.RES Page 11 Date: 04/21/2014 File name: LR0204ZZ.RES Page 12

```
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 2727.15
                             Tc(MIN.) = 44.80
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.58
 TOTAL AREA (ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                Tc Intensity Fp(Fm)
  STREAM
           0
                                       Ар Ае
                                                  HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
         211.99 25.02 1.640 0.75(0.44) 0.59 196.7 20400.00
   1
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.85;6H= 2.64;24H= 5.89
 S-GRAPH: VALLEY (DEV.) = 44.4%; VALLEY (UNDEV.) / DESERT= 55.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.58; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.79; 30M = 0.79; 1HR = 0.79;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0355; Lca/L=0.4,n=.0318; Lca/L=0.5,n=.0292; Lca/L=0.6,n=.0273
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1048.78
 PEAK FLOW RATE (CFS) = 2813.02
*******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 20410.00 TO NODE 20452.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1533.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1329.02 CHANNEL SLOPE = 0.0173
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 2813.02
 FLOW VELOCITY (FEET/SEC.) = 27.54 FLOW DEPTH (FEET) = 4.75
 TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 45.60
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
******************
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
```

>>>>ADDITION OF SUBAR	EA TO MAIN	LINE PEAK	FLOW<					
MAINLINE Tc(MIN.) =	<b>45.60</b>							
* 25 YEAR RAINFALL IN		CH/HR) =	1.144					
SUBAREA LOSS RATE DATA								
DEVELOPMENT TYPE/			Fρ	qД	SCS			
LAND USE								
RESIDENTIAL								
"3-4 DWELLINGS/ACRE"	В	25.77	0.75	0.600	56			
PUBLIC PARK	В	1.54		0.850	56			
NATURAL FAIR COVER								
"OPEN BRUSH"	В	0.79	0.61	1.000	66			
COMMERCIAL	В	0.05	0.75	1.000 0.100	56			
MOBILE HOME PARK	В	5.02	0.75	0.250	56			
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74								
SUBAREA AVERAGE PERVIO	US AREA FR	ACTION, A	p = 0.567					
SUBAREA AREA(ACRES) =	33.17							
UNIT-HYDROGRAPH DATA:								
RAINFALL(INCH): 5M= 0.					24H= 5.88			
S-GRAPH: VALLEY (DEV.) =								
MOUNTAIN= 0.								
Tc(HR) = 0.76; LAG(HR)								
USED SIERRA MADRE DEPT								
DEPTH-AREA FACTORS: 5M			: 1HR = 0.7	9;				
3HR = 0.97; 6HR = 0.98; 24HR= 0.99 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4897.4								
					OC 44 DDDB			
LONGEST FLOWPATH FROM			JDE 20452.	00 = 270	96.44 FEET.			
~	EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0284; Lca/L=0.6,n=.0265							
TIME OF PEAK FLOW(HR)					-0.0,110203			
, ,			. ,	1000.79				
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2795.39  TOTAL AREA(ACRES) = 4897.4 PEAK FLOW RATE(CFS) = 2813.02								
NOTE: PEAK FLOW RATE D			,	010)	2010:02			
1012, 1211, 1201, 14112		0 01011.						
SUBAREA AREA-AVERAGED	RAINFALL D	EPTH (INCH	):					
5M = 0.36; 30M = 0.74;				2.27; 24HI	R = 4.72			
*******	*****	*****	******	*****	*****			
FLOW PROCESS FROM NODE	20452.00	TO NODE	20452.00 I	S CODE =	10			
>>>>MAIN-STREAM MEMOR	Y COPIED O	NTO MEMOR	Y BANK # 1	<<<<				
	=======		=======	=======	========			
******								
FLOW PROCESS FROM NODE	20420.00	TO NODE	20421.00 1	S CODE = .	21			
>>>>RATIONAL METHOD I	NITTAI. SIIR	AREA ANAL	VSTS<<<<<					
>>USE TIME-OF-CONCENTR				BAREA<<				
	========	=======		========	=======			
INITIAL SUBAREA FLOW-L	ENGTH (FEET	) = 575	.26					
ELEVATION DATA: UPSTRE	AM(FEET) =	1740.0	DOWNSTRE.	AM(FEET) =	1735.00			
Tc = K*[(LENGTH** 3.00	)/(ELEVATI	ON CHANGE	)]**0.20					
SUBAREA ANALYSIS USED	MINIMUM Tc	(MIN.) =	11.027					
* 25 YEAR RAINFALL IN	TENSITY(IN	CH/HR) =	2.680					
SUBAREA TC AND LOSS RA	TE DATA(AM	C II):						
DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Аp	SCS Tc			
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN (MIN.)			
Date: 04/21/2014	File nan	ne: LR0204Z2	Z.RES	F	Page 14			

```
RESIDENTIAL.
                                                                             "3-4 DWELLINGS/ACRE"
                    A
                              0.69
                                       0.98
                                              0.600 32 13.52
                                                                              UPSTREAM ELEVATION(FEET) = 1725.00 DOWNSTREAM ELEVATION(FEET) = 1712.00
                              4.22
 MOBILE HOME PARK A
                                    0.98 0.250 32 11.03
                                                                              STREET LENGTH (FEET) = 299.17 CURB HEIGHT (INCHES) = 8.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                              STREET HALFWIDTH (FEET) = 32.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.299
 SUBAREA RUNOFF (CFS) = 10.56
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 TOTAL AREA (ACRES) = 4.91 PEAK FLOW RATE (CFS) =
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.72
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
*****************
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 FLOW PROCESS FROM NODE 20421.00 TO NODE 20422.00 IS CODE = 92
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
______
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                               35.68
 UPSTREAM NODE ELEVATION (FEET) = 1735.00
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 DOWNSTREAM NODE ELEVATION (FEET) = 1725.00
                                                                                STREET FLOW DEPTH(FEET) = 0.51
 CHANNEL LENGTH THRU SUBAREA (FEET) = 643.67
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 17.51
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.48
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.79
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 14.50
 MAXIMUM DEPTH(FEET) = 1.00
                                                                              * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.274
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.365
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                    Fр
                                                     SCS
                                                                                                  A 2.62 0.98
     LAND USE
                                                                                                                           0.250
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              MOBILE HOME PARK
                                                                                                                                    32
 MOBILE HOME PARK
                     A
                              2.50
                                       0.98
                                               0.250 32
                                                                              SCHOOL
                                                                                                          0.15 0.98
                                                                                                                            0.600
                                                                                                   A 1.21 0.98
                                                                                                                            0.100
                                                                                                                                    32
 RESIDENTIAL
                                                                              COMMERCIAL
 "3-4 DWELLINGS/ACRE" A 0.99
                                                    32
                                       0.98
                                               0.600
                                                                              COMMERCIAL
                                                                                                            2.01
                                                                                                                     0.75
                                                                                                                            0.100
                            2.87
 COMMERCIAL
                     A
                                       0.98
                                               0.100
                                                     32
                                                                              RESIDENTIAL
 COMMERCIAL
                      В
                              1.82
                                       0.75
                                               0.100 56
                                                                              "3-4 DWELLINGS/ACRE" B 1.63 0.75 0.600
 RESIDENTIAL
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
 "3-4 DWELLINGS/ACRE" B 2.05
                                       0.75
                                              0.600 56
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
                                                                              SUBAREA AREA (ACRES) = 7.62 SUBAREA RUNOFF (CFS) = 14.04
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.285
                                                                              EFFECTIVE AREA(ACRES) = 22.76 AREA-AVERAGED Fm(INCH/HR) = 0.25
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.28
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.28
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.19
                                                                              TOTAL AREA (ACRES) = 22.8 PEAK FLOW RATE (CFS) = 41.48
 AVERAGE FLOW DEPTH(FEET) = 0.59 FLOOD WIDTH(FEET) = 31.45
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.56 Tc (MIN.) = 13.59
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 10.23 SUBAREA RUNOFF(CFS) = 19.50
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.29
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) =
                                                                              DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 18.60
                                                                              FLOW VELOCITY (FEET/SEC.) = 5.68 DEPTH*VELOCITY (FT*FT/SEC.) = 3.01
                                                                              LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20423.00 = 1518.10 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                             ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                              FLOW PROCESS FROM NODE 20423.00 TO NODE 20424.00 IS CODE = 63
 DEPTH(FEET) = 0.64 FLOOD WIDTH(FEET) = 37.28
 FLOW VELOCITY (FEET/SEC.) = 4.38 DEPTH*VELOCITY (FT*FT/SEC) = 2.81
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20422.00 = 1218.93 FEET.
                                                                              >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                             ______
******************
                                                                              UPSTREAM ELEVATION(FEET) = 1712.00 DOWNSTREAM ELEVATION(FEET) = 1703.00
 FLOW PROCESS FROM NODE 20422.00 TO NODE 20423.00 IS CODE = 63
                                                                              STREET LENGTH (FEET) = 258.55 CURB HEIGHT (INCHES) = 8.0
                                                                              STREET HALFWIDTH (FEET) = 32.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
```

Date: 04/21/2014

File name: LR0204ZZ.RES

Page 16

Date: 04/21/2014

File name: LR020477.RFS

```
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    52.36
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.58
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 21.26
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.56
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.24
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 15.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.152
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.56
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 20.32
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.35
                                                                                      LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.02
                                                                                 MOBILE HOME PARK
                                                                                                      B 0.06 0.75 0.250
 STREET FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 15.30
                                                                                                               1.63
                                                                                                                         0.75
                                                                                                                                 0.100
                                                                                  COMMERCIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.202
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "3-4 DWELLINGS/ACRE" B 1.63 0.75 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.348
 MOBILE HOME PARK
                    A
                                0.47
                                         0.98
                                                 0.250
                                                                                  SUBAREA AREA(ACRES) = 3.32
                                                                                                               SUBAREA RUNOFF(CFS) = 5.65
 MOBILE HOME PARK
                      В
                                0.58
                                         0.75
                                                 0.250 56
                                                                                  EFFECTIVE AREA(ACRES) = 31.38 AREA-AVERAGED Fm(INCH/HR) = 0.24
 COMMERCIAL
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.29
                       В
                              2.83
                                         0.75
                                                 0.100 56
                       A
                                                                                  TOTAL AREA (ACRES) = 31.4 PEAK FLOW RATE (CFS) = 53.94
 COMMERCIAL
                                0.03
                                         0.98
                                                 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.39
                                      0.75
                                                0.600 56
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.261
 SUBAREA AREA(ACRES) = 5.30 SUBAREA RUNOFF(CFS) = 9.55
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 28.06 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                                  DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.49
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.28
                                                                                  FLOW VELOCITY (FEET/SEC.) = 5.61 DEPTH*VELOCITY (FT*FT/SEC.) = 3.30
 TOTAL AREA (ACRES) = 28.1 PEAK FLOW RATE (CFS) =
                                                                                  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20425.00 = 1974.21 FEET.
                                                                                ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                 FLOW PROCESS FROM NODE 20425.00 TO NODE 20426.00 IS CODE = 92
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 20.87
                                                                                _____
 FLOW VELOCITY (FEET/SEC.) = 5.45 DEPTH*VELOCITY (FT*FT/SEC.) = 3.14
                                                                                  UPSTREAM NODE ELEVATION (FEET) = 1696.00
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20424.00 = 1776.65 FEET.
                                                                                 DOWNSTREAM NODE ELEVATION (FEET) = 1685.00
                                                                                  CHANNEL LENGTH THRU SUBAREA (FEET) = 834.27
******************
                                                                                  "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                  PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 FLOW PROCESS FROM NODE 20424.00 TO NODE 20425.00 IS CODE = 63
                                                                                  PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                  MAXIMUM DEPTH(FEET) = 1.00
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.943
_____
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 UPSTREAM ELEVATION(FEET) = 1703.00 DOWNSTREAM ELEVATION(FEET) = 1696.00
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fр
 STREET LENGTH (FEET) = 197.56 CURB HEIGHT (INCHES) = 8.0
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                      В 1.17
                                                                                                                         0.75
                                                                                                                                 0.600
                                                                                                                                         56
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                                        В
                                                                                                                0.01
                                                                                                                         0.75
                                                                                                                                 0.250
                                                                                                                                         56
                                                                                  MOBILE HOME PARK
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 COMMERCIAL
                                                                                                       В
                                                                                                              0.54
                                                                                                                          0.75
                                                                                                                                 0.100
                                                                                                                                         56
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  COMMERCIAL
                                                                                                              3.24
                                                                                                                         0.98
                                                                                                                                 0.100
                                                                                                                                         32
                                                                                                       A
                                                                                  RESIDENTIAL
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  "3-4 DWELLINGS/ACRE" A 4.60
                                                                                                                         0.98
                                                                                                                                 0.600
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
```

Date: 04/21/2014

File name: LR0204ZZ.RES

Page 18

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

Date: 04/21/2014 File name: LR0204ZZ.RES Page 17

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               FLOW PROCESS FROM NODE 20472.00 TO NODE 20473.00 IS CODE = 92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.71
 AVERAGE FLOW DEPTH(FEET) = 0.78 FLOOD WIDTH(FEET) = 53.71
                                                                               >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.96 Tc (MIN.) = 18.85
                                                                              _____
 SUBAREA AREA(ACRES) = 9.56
                               SUBAREA RUNOFF(CFS) = 13.50
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1676.00
 EFFECTIVE AREA(ACRES) = 40.94 AREA-AVERAGED Fm(INCH/HR) = 0.27
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1668.00
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.31
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 300.94
                                                                               "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 TOTAL AREA (ACRES) = 40.9
                                PEAK FLOW RATE(CFS) =
                                                                               PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                               PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                               MAXIMUM DEPTH(FEET) = 1.00
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.853
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 DEPTH(FEET) = 0.78 FLOOD WIDTH(FEET) = 54.01
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
                                                                                                                                     SCS
 FLOW VELOCITY (FEET/SEC.) = 4.72 DEPTH*VELOCITY (FT*FT/SEC) = 3.70
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20426.00 = 2808.48 FEET.
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                   A
                                                                                                             5.53
                                                                                                                      0.98
                                                                                                                              0.600
                                                                                                                                     32
A
                                                                                                             0.78
                                                                                                                      0.98
                                                                                                                              0.100
                                                                                                                                     32
                                                                               COMMERCIAL
 FLOW PROCESS FROM NODE 20426.00 TO NODE 20427.00 IS CODE = 92
                                                                               MOBILE HOME PARK
                                                                                                    A
                                                                                                             2.12
                                                                                                                      0.98
                                                                                                                              0.250
                                                                                                                                     32
______
                                                                               RESIDENTIAL
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
                                                                               "3-4 DWELLINGS/ACRE" B 0.52
                                                                                                                      0.75 0.600
_____
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
 UPSTREAM NODE ELEVATION (FEET) = 1685.00
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.474
 DOWNSTREAM NODE ELEVATION (FEET) = 1676.00
                                                                               TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 75.94
 CHANNEL LENGTH THRU SUBAREA (FEET) = 311.63
                                                                               TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.53
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                               AVERAGE FLOW DEPTH (FEET) = 0.76 FLOOD WIDTH (FEET) = 50.87
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                               "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 20.41
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                               SUBAREA AREA(ACRES) = 8.95
                                                                                                             SUBAREA RUNOFF(CFS) = 11.27
 MAXIMUM DEPTH (FEET) = 1.00
                                                                               EFFECTIVE AREA(ACRES) = 58.15 AREA-AVERAGED Fm(INCH/HR) = 0.33
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.896
                                                                               TOTAL AREA (ACRES) = 58.1 PEAK FLOW RATE (CFS) =
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                                      79.67
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                                      SCS
                                    Fp
                                                Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 COMMERCIAL
                      A 1.60 0.98
                                               0.100
                                                                               5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 6.06
                                        0.98
                                               0.600
                                                       32
                                                                               END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                               DEPTH (FEET) = 0.77 FLOOD WIDTH (FEET) = 51.91
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 0.60
                                        0.75
                                                                               FLOW VELOCITY (FEET/SEC.) = 6.59 DEPTH*VELOCITY (FT*FT/SEC) = 5.05
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
                                                                               LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20473.00 = 3421.05 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.503
                                                                              *******************
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 66.79
                                                                               FLOW PROCESS FROM NODE 20428.00 TO NODE 20429.00 IS CODE = 92
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.59
 AVERAGE FLOW DEPTH(FEET) = 0.73 FLOOD WIDTH(FEET) = 47.28
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 19.64
                                                                               >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 SUBAREA AREA(ACRES) = 8.26
                               SUBAREA RUNOFF (CFS) = 10.52
                                                                              _____
 EFFECTIVE AREA(ACRES) = 49.20
                               AREA-AVERAGED Fm(INCH/HR) = 0.31
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1668.00
 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.34
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1664.00
 TOTAL AREA (ACRES) = 49.2 PEAK FLOW RATE (CFS) =
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 362.53
                                                         70.31
                                                                               "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                               PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                               MAXIMUM DEPTH(FEET) = 1.00
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.787
 DEPTH (FEET) = 0.74 FLOOD WIDTH (FEET) = 48.33
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 6.66 DEPTH*VELOCITY (FT*FT/SEC) = 4.89
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fρ
                                                                                                                              αA
                                                                                                                                     SCS
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20427.00 = 3120.11 FEET.
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   LAND USE
                                                                               COMMERCIAL
                                                                                                     Α
                                                                                                             0.97
                                                                                                                      0.98
                                                                                                                              0.100
RESIDENTIAL
```

Date: 04/21/2014 File name: LR0204ZZ.RES Page 19

Date: 04/21/2014

File name: LR0204ZZ.RES

"3-4 DWELLINGS/ACRE" A 13.68 0.98 0.600 32  MOBILE HOME PARK A 3.07 0.98 0.250 32  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.25 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.68  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 4.78  AVERAGE FLOW DEPTH(FEET) = 0.88 FLOOD WIDTH(FEET) = 65.66	MOBILE HOME PARK  A 14.89 0.98 0.250 32  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392  SUBAREA AREA(ACRES) = 44.19 SUBAREA RUNOFF(CFS) = 50.01  EFFECTIVE AREA(ACRES) = 121.31 AREA-AVERAGED Fm(INCH/HR) = 0.38  AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.40  TOTAL AREA(ACRES) = 121.3 PEAK FLOW RATE(CFS) = 138.07  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
"V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 21.67  SUBAREA AREA (ACRES) = 18.97 SUBAREA RUNOFF (CFS) = 22.05  EFFECTIVE AREA (ACRES) = 77.12 AREA-AVERAGED Fm (INCH/HR) = 0.37  AREA-AVERAGED Fp (INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.40  TOTAL AREA (ACRES) = 77.1 PEAK FLOW RATE (CFS) = 98.28	5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.77  FLOW VELOCITY(FEET/SEC.) = 7.02 DEPTH*VELOCITY(FT*FT/SEC.) = 5.30
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50  END OF SUBAREA "V" GUTTER HYDRAULICS:	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,  AND L = 1363.1 FT WITH ELEVATION-DROP = 36.0 FT, IS 89.9 CFS,  WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20430.00  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20430.00 = 5146.63 FEET.
DEPTH(FEET) = 0.90 FLOOD WIDTH(FEET) = 67.90 FLOW VELOCITY(FEET/SEC) = 4.86 DEPTH*VELOCITY(FT*FT/SEC) = 4.38 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20429.00 = 3783.58 FEET.	**************************************
FLOW PROCESS FROM NODE 20429.00 TO NODE 20430.00 IS CODE = 63	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	UPSTREAM ELEVATION(FEET) = 1628.00 DOWNSTREAM ELEVATION(FEET) = 1625.00 STREET LENGTH(FEET) = 1350.21 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
UPSTREAM ELEVATION(FEET) = 1664.00 DOWNSTREAM ELEVATION(FEET) = 1628.00 STREET LENGTH(FEET) = 1363.05 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.15  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 1.16
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.31  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.73  HALFSTREET FLOOD WIDTH(FEET) = 29.49  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.80	HALFSTREET FLOOD WIDTH (FEET) = 51.09  AVERAGE FLOW VELOCITY(FEET/SEC.) = 2.72  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.16  STREET FLOW TRAVEL TIME(MIN.) = 8.27 Tc(MIN.) = 33.27  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.382  SUBAREA LOSS RATE DATA(AMC II):
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.97  STREET FLOW TRAVEL TIME(MIN.) = 3.34 Tc(MIN.) = 25.01  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.640  SUBAREA LOSS RATE DATA(AMC II):	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL A 9.50 0.98 0.100 32 RESIDENTIAL
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" A 21.36 0.98 0.600 32	"3-4 DWELLINGS/ACRE" A 1.03 0.98 0.600 32  COMMERCIAL B 0.37 0.75 0.100 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.147
COMMERCIAL A 7.94 0.98 0.100 32	SUBAREA AREA(ACRES) = 10.90 SUBAREA RUNOFF(CFS) = 12.15

Date: 04/21/2014

File name: LR0204ZZ.RES

Page 22

Date: 04/21/2014

File name: LR0204ZZ.RES

```
EFFECTIVE AREA(ACRES) = 132.21 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.38
 TOTAL AREA (ACRES) = 132.2 PEAK FLOW RATE (CFS) = 138.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.14 HALFSTREET FLOOD WIDTH(FEET) = 50.24
 FLOW VELOCITY (FEET/SEC.) = 2.70 DEPTH*VELOCITY (FT*FT/SEC.) = 3.09
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 5.17
 PIPE-FLOW(CFS) =
                   73.38
 PIPEFLOW TRAVEL TIME (MIN.) = 4.35 Tc (MIN.) = 29.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.489
 SUBAREA AREA(ACRES) = 10.90 SUBAREA RUNOFF(CFS) = 13.21
 TOTAL AREA (ACRES) = 132.2 PEAK FLOW RATE (CFS) = 138.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 64.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 37.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.01
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.84 FEET.
********************
 FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 29.36
 RAINFALL INTENSITY (INCH/HR) = 1.49
 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp (INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 132.21
 TOTAL STREAM AREA(ACRES) = 132.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 138.07
FLOW PROCESS FROM NODE 20440.00 TO NODE 20441.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
```

```
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 918.39
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1706.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.596
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.475
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Аp
                                                        SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.48 0.75 0.600 56 12.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 9.99
 TOTAL AREA(ACRES) = 5.48 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.72
******************
 FLOW PROCESS FROM NODE 20441.00 TO NODE 20442.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1706.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH (FEET) = 478.44 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 13.65
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.81
 STREET FLOW TRAVEL TIME (MIN.) = 5.44 Tc (MIN.) = 18.03
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.995
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                        SCS
                                                αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.22 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.22 SUBAREA RUNOFF (CFS) = 7.27
```

Date: 04/21/2014 File name: LR020477.RFS Page 23 Date: 04/21/2014 File name: LR0204ZZ.RES

```
EFFECTIVE AREA(ACRES) = 10.70 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 10.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.37
 FLOW VELOCITY (FEET/SEC.) = 1.51 DEPTH*VELOCITY (FT*FT/SEC.) = 0.86
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20442.00 = 1396.83 FEET.
*****
 FLOW PROCESS FROM NODE 20442.00 TO NODE 20443.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1705.00 DOWNSTREAM ELEVATION(FEET) = 1704.00
 STREET LENGTH (FEET) = 220.75 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.17
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.33
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.16
 STREET FLOW TRAVEL TIME (MIN.) = 1.73 Tc (MIN.) = 19.76
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.889
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                qΑ
                                                         SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               6.59
                                          0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 6.59 SUBAREA RUNOFF (CFS) = 8.54
 EFFECTIVE AREA(ACRES) = 17.29 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 17.3 PEAK FLOW RATE (CFS) =
                                                          22.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.55
```

```
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 220.8 FT WITH ELEVATION-DROP = 1.0 FT, IS 13.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20443.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20443.00 = 1617.58 FEET.
**********************
 FLOW PROCESS FROM NODE 20443.00 TO NODE 20444.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1704.00 DOWNSTREAM ELEVATION (FEET) = 1702.00
 STREET LENGTH (FEET) = 263.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  26.77
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.94
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.82
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.57
 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 21.32
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.805
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.15 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 7.15 SUBAREA RUNOFF (CFS) = 8.73
 EFFECTIVE AREA(ACRES) = 24.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 24.4 PEAK FLOW RATE (CFS) =
                                                        29.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.74
 FLOW VELOCITY (FEET/SEC.) = 2.93 DEPTH*VELOCITY (FT*FT/SEC.) = 1.68
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20444.00 = 1881.08 FEET.
*****************
 FLOW PROCESS FROM NODE 20444.00 TO NODE 20445.00 IS CODE = 63
```

Page 26

FLOW VELOCITY (FEET/SEC.) = 2.24 DEPTH\*VELOCITY (FT\*FT/SEC.) = 1.28

Date: 04/21/2014 File name: LR0204ZZ.RES Page 25 Date: 04/21/2014 File name: LR0204ZZ.RES

```
>>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
_____
 UPSTREAM ELEVATION(FEET) = 1702.00 DOWNSTREAM ELEVATION(FEET) = 1701.00
 STREET LENGTH (FEET) = 498.43 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.42
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.45
 STREET FLOW TRAVEL TIME (MIN.) = 4.32 Tc (MIN.) = 25.63
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.616
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.46 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.46 SUBAREA RUNOFF (CFS) = 15.19
 EFFECTIVE AREA(ACRES) = 38.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 38.9 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.68
 FLOW VELOCITY (FEET/SEC.) = 1.96 DEPTH*VELOCITY (FT*FT/SEC.) = 1.52
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 498.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 21.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20445.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20445.00 = 2379.51 FEET.
******************
 FLOW PROCESS FROM NODE 20445.00 TO NODE 20446.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1701.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 STREET LENGTH (FEET) = 790.41 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     50.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 37.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.54
 STREET FLOW TRAVEL TIME (MIN.) = 7.61 Tc (MIN.) = 33.25
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.382
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 22.19 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 22.19 SUBAREA RUNOFF (CFS) = 18.64
 EFFECTIVE AREA(ACRES) = 61.09 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 61.1 PEAK FLOW RATE (CFS) = 51.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90 HALFSTREET FLOOD WIDTH(FEET) = 37.97
 FLOW VELOCITY (FEET/SEC.) = 1.74 DEPTH*VELOCITY (FT*FT/SEC.) = 1.56
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 790.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 25.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20446.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20446.00 = 3169.92 FEET.
******************
 FLOW PROCESS FROM NODE 20446.00 TO NODE 20447.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 962.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

File name: LR0204ZZ.RES

Page 28

Date: 04/21/2014

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 62.12 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.62HALFSTREET FLOOD WIDTH (FEET) = 23.28 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.54 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.46 STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 36.14 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.315 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.08 0.75 0.600 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 24.90 0.98 0.600 32 SCHOOL A 1.29 0.98 0.600 32 SCHOOL В 3.53 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA RUNOFF (CFS) = 21.57SUBAREA AREA(ACRES) = 31.80 EFFECTIVE AREA(ACRES) = 92.89 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.60 TOTAL AREA(ACRES) = 92.9 PEAK FLOW RATE(CFS) = 69.19 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH (FEET) = 0.64 HALFSTREET FLOOD WIDTH (FEET) = 24.27 FLOW VELOCITY (FEET/SEC.) = 5.69 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.66 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20447.00 = 4131.92 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20447.00 TO NODE 20448.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1645.00 STREET LENGTH (FEET) = 877.54 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.01
 STREET FLOW TRAVEL TIME (MIN.) = 2.51 Tc (MIN.) = 38.65
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.263
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A
                              9.63
                                         0.98
                                                0.600
 COMMERCIAL
                              12.07
                                        0.98
                                                0.100
                                                        32
                        Α
 COMMERCIAL
                        В
                              0.31
                                        0.75
                                                0.100
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                              2.23
                                        0.75
                                                0.600
                                                        56
                        B 11.63
                                        0.75
                                                0.600
 SCHOOL
 SCHOOL
                              1.95
                                        0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.436
 SUBAREA AREA (ACRES) = 37.82 SUBAREA RUNOFF (CFS) = 30.21
 EFFECTIVE AREA(ACRES) = 130.71 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.55
 TOTAL AREA (ACRES) = 130.7 PEAK FLOW RATE (CFS) =
                                                         95.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.13
 FLOW VELOCITY (FEET/SEC.) = 6.09 DEPTH*VELOCITY (FT*FT/SEC.) = 4.32
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 877.5 FT WITH ELEVATION-DROP = 25.0 FT, IS 88.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20448.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20448.00 = 5009.46 FEET.
******************
 FLOW PROCESS FROM NODE 20448.00 TO NODE 20449.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1645.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
 STREET LENGTH (FEET) = 820.27 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.60
```

File name: LR0204ZZ.RES

Page 30

Date: 04/21/2014

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                ** PEAK FLOW RATE TABLE **
  STREET FLOW DEPTH(FEET) = 0.75
  HALFSTREET FLOOD WIDTH (FEET) = 29.96
                                                                                        Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.01
                                                                                NUMBER
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.48
                                                                                 1
                                                                                         246.92 29.36 1.489 0.87 (0.39) 0.45 246.6 20420.00
 STREET FLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 40.93
                                                                                         218.43 40.93 1.220 0.86(0.40) 0.46 291.6 20440.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.220
                                                                                COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                PEAK FLOW RATE (CFS) = 246.92 Tc (MIN.) = 29.36
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                Αp
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                EFFECTIVE AREA(ACRES) = 246.56 AREA-AVERAGED Fm(INCH/HR) = 0.39
                             3.48
                                               0.100
                                                      32
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.45
 COMMERCIAL
                      A
                                       0.98
 COMMERCIAL
                      В
                               6.53
                                        0.75
                                                0.100
                                                                                TOTAL AREA (ACRES) =
                                                                                                  291.6
                                                                                LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.84 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.34
                                        0.98
                                                0.600
                                                                              ******************
 RESIDENTIAL
                    В
 "3-4 DWELLINGS/ACRE"
                               1.38
                                        0.75
                                               0.600
                                                     56
                                                                                FLOW PROCESS FROM NODE 20449.00 TO NODE 20450.00 IS CODE = 63
                               0.64
                                        0.98
                                               0.600
 SCHOOL
                       A
 SCHOOL
                       В
                               16.30
                                        0.75
                                             0.600 56
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
                                                                               >>>> (STREET TABLE SECTION # 18 USED) <<<<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
                                                                              ______
 SUBAREA AREA (ACRES) = 28.67 SUBAREA RUNOFF (CFS) = 23.08
                                                                                UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1595.00
 EFFECTIVE AREA(ACRES) = 159.38 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                STREET LENGTH (FEET) = 1304.02 CURB HEIGHT (INCHES) = 8.0
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.53
                                                                                STREET HALFWIDTH (FEET) = 26.00
 TOTAL AREA (ACRES) = 159.4 PEAK FLOW RATE (CFS) = 113.13
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.51
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 FLOW VELOCITY (FEET/SEC.) = 6.15 DEPTH*VELOCITY (FT*FT/SEC.) = 4.65
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20449.00 = 5829.73 FEET.
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
*****
 FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                 STREET FLOW DEPTH (FEET) = 1.02
_____
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 43.58
 TOTAL NUMBER OF STREAMS = 2
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.96
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.10
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.73 Tc (MIN.) = 32.09
 TIME OF CONCENTRATION (MIN.) = 40.93
 RAINFALL INTENSITY (INCH/HR) = 1.22
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.412
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
 AREA-AVERAGED Fp(INCH/HR) = 0.81
                                                                                                                      Fρ
                                                                                                                                     SCS
 AREA-AVERAGED Ap = 0.53
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                             33.74 0.98
                                                                                                                                      32
 EFFECTIVE STREAM AREA(ACRES) = 159.38
                                                                                                                              0.100
                                                                                COMMERCIAL
                                                                                                    A
 TOTAL STREAM AREA(ACRES) = 159.38
                                                                                MOBILE HOME PARK
                                                                                                             22.38
                                                                                                                              0.250
                                                                                                                                      56
                                                                                                     В
                                                                                                                       0.75
                                                                                                       B 19.61
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 113.13
                                                                                COMMERCIAL
                                                                                                                       0.75
                                                                                                                              0.100
                                                                                                                                      56
                                                                                AGRICULTURAL FAIR COVER
 ** CONFLUENCE DATA **
                                                                                                    В 9.23
                                                                                "ORCHARDS"
                                                                                                                       0.63
                                                                                                                              1.000
  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                      HEADWATER
                                                                                RESIDENTIAL
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                "3-4 DWELLINGS/ACRE" B 8.18
                                                                                                                       0.75
                                                                                                                              0.600
                                                                                                                                      56
    1
          138.07 29.36 1.489 0.94(0.36) 0.38 132.2 20420.00
                                                                                RESIDENTIAL
    2
          113.13 40.93 1.220 0.81(0.43)0.53 159.4 20440.00
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                    A 7.04
                                                                                                                      0.98 0.600
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.292
```

CONFLUENCE FORMULA USED FOR 2 STREAMS.

Date: 04/21/2014 File name: LR0204ZZ.RES Page 31

\*\*\*STREET FLOWING FULL\*\*\*

File name: LR0204ZZ.RES

Page 32

Date: 04/21/2014

```
SUBAREA AREA(ACRES) = 100.18
                               SUBAREA RUNOFF(CFS) = 107.01
 EFFECTIVE AREA(ACRES) = 346.74 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.40
 TOTAL AREA(ACRES) = 391.8
                                PEAK FLOW RATE (CFS) = 333.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.05 HALFSTREET FLOOD WIDTH(FEET) = 45.28
 FLOW VELOCITY (FEET/SEC.) = 8.18 DEPTH*VELOCITY (FT*FT/SEC.) = 8.60
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.30
 PIPE-FLOW(CFS) = 169.12
 PIPEFLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 30.78
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.448
 SUBAREA AREA(ACRES) = 100.18 SUBAREA RUNOFF(CFS) = 110.23
 TOTAL AREA (ACRES) = 391.8 PEAK FLOW RATE (CFS) = 344.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 175.58
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.86
   HALFSTREET FLOOD WIDTH (FEET) = 35.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.94
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 1304.0 FT WITH ELEVATION-DROP = 30.0 FT, IS 216.7 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20450.00
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          344.69 30.78 1.448 0.85(0.34)0.40 346.7 20420.00
    1
    2
           296.13 42.49 1.193 0.85(0.35) 0.42
                                                391.8 20440.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 344.69 Tc (MIN.) = 30.78
 AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.85
 AREA-AVERAGED Ap = 0.40 EFFECTIVE AREA(ACRES) = 346.74
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20450.00 = 7800.86 FEET.
******************
 FLOW PROCESS FROM NODE 20450.00 TO NODE 20451.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1530.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 2921.86 CHANNEL SLOPE = 0.0222
```

```
CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 344.69
 FLOW VELOCITY (FEET/SEC.) = 9.24 FLOW DEPTH (FEET) = 2.49
 TRAVEL TIME (MIN.) = 5.27 Tc (MIN.) = 36.05
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20451.00 = 10722.72 FEET.
******************
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20451.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE TC (MIN.) = 36.05
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.317
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                        Ар
                                                SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 19.78 0.75 0.600
                                                 56
                          5.95 0.75
 COMMERCIAL
                    В
                                          0.100
                                                 56
 MOBILE HOME PARK
                   В
                          6.72
                                   0.75
                                          0.250
 PUBLIC PARK
                    В
                          6.76
                                   0.75 0.850
 SCHOOL
                     В
                          5.51
                                   0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.519
 SUBAREA AREA(ACRES) = 44.72
                           SUBAREA RUNOFF (CFS) = 37.38
 EFFECTIVE AREA(ACRES) = 391.46 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 436.5
                            PEAK FLOW RATE (CFS) = 344.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.72
*************************
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20452.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1530.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1273.13 CHANNEL SLOPE = 0.0157
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 344.69
 FLOW VELOCITY (FEET/SEC.) = 8.17 FLOW DEPTH (FEET) = 2.73
 TRAVEL TIME (MIN.) = 2.60 Tc (MIN.) = 38.65
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20452.00 = 11995.85 FEET.
******************
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_______
 MAINLINE Tc(MIN.) = 38.65
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.263
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp Ap
                                                SCS
      Date: 04/21/2014 File name: LR0204ZZ.RES
                                               Page 34
```

LAND USE	GROUP (A	ACRES) (	INCH/HR)	(DECIMAL)	CN	>>>>CLEAR MEMORY BANK #					
"3-4 DWELLINGS/ACRE"	В	6.50	0.75	0.600	56						
COMMERCIAL	В	3.31	0.75	0.100	56	*******	*******	******	******	*****	*****
RESIDENTIAL	ь	3.31	0.75	0.100	50	 FLOW PROCESS FROM NODE	20452 00	TO NODE '	20/53 OO T	S CODE =	5.4
"3-4 DWELLINGS/ACRE"	A	0.25	0.98	0.600	32	 FLOW FROCESS FROM NODE					
NATURAL FAIR COVER	A	0.23	0.90	0.000	52	 >>>>COMPUTE TRAPEZOIDAL					
"OPEN BRUSH"	В	0.07	0.61	1.000	66						
PUBLIC PARK	В	0.07		0.850	56	>>>>TRAVELTIME THRU SUB					
					30	 ELEVATION DATA: UPSTREAM					
SUBAREA AVERAGE PERVIO				. 75			. ,			, ,	
SUBAREA AVERAGE PERVIO				۵) ٥ ١	- (	 CHANNEL LENGTH THRU SUBAI				IEL SLOPE =	0.0206
SUBAREA AREA (ACRES) =			•	S) = 8.5		 CHANNEL BASE (FEET) = 12				. 00	
EFFECTIVE AREA(ACRES) AREA-AVERAGED Fp(INCH/					= 0.40	 MANNING'S FACTOR = 0.015		•	,	.00	
TOTAL AREA (ACRES) =			-		244 60	 CHANNEL FLOW THRU SUBAREZ	. ,			_ 4.70	
, ,			,	CFS) =	344.69	FLOW VELOCITY (FEET/SEC.)				= 4.79	
NOTE: PEAK FLOW RATE D	PEFAULTED TO (	UPSIREAM	VALUE			 TRAVEL TIME (MIN.) = 1.8				00 - 204	01 02 EEEM
	DATMEATT DEDG	mii (TNOII)				 LONGEST FLOWPATH FROM NO	DE 2012(	.00 TO NOI	DE 20453.	00 = 304	91.93 FEET.
SUBAREA AREA-AVERAGED				0 07. 0411	. 4 70	 ***********					
5M = 0.36; 30M = 0.74;	IHR = 0.97;	3HK = 1.	63; 6HK =	2.21; 24HI	X = 4.72						
******		ale ale ale ale ale ale ale ale ale	ale ale ale ale ale ale ale ale	ale		 FLOW PROCESS FROM NODE 2					
FLOW PROCESS FROM NODE						>>>>ADDITION OF SUBAREA					
								=======	=======	:=======	========
>>>>CONFLUENCE MEMORY						 MAINLINE TC (MIN.) = 47		NII / IID )	116		
=======================================	:=======	======	:======	=======	========	 * 25 YEAR RAINFALL INTE	•	CH/HK) = .	1.116		
						 SUBAREA LOSS RATE DATA (AI	,		_	_	
** MAIN STREAM CONFLUE				_		 - '	SCS SOIL		Fp	Ap	SCS
	c Intensity							(ACRES)			
, , ,	N.) (INCH/HR)		,	(ACRES)			В	20.13	0.75	0.250	56
	1.263				20420.00	 RESIDENTIAL					
	1.073		,			 "3-4 DWELLINGS/ACRE"		19.32	0.75	0.600	56
LONGEST FLOWPATH FROM	NODE 20420.0	00 TO NOD	E 20452.	00 = 1199	95.85 FEET.	 SCHOOL	В	8.94	0.75	0.600	56
						 COMMERCIAL	В	4.10	0.75	0.100	56
** MEMORY BANK # 1 CO	NFLUENCE DATA	A **				 PUBLIC PARK	В	1.64	0.75	0.850	56
PEAK FLOW RATE(CFS) =	2813.02	Tc (MIN	1.) = 45	.60		 RESIDENTIAL					
AREA-AVERAGED Fm (INCH/	'HR) = 0.58	Ybar =	0.58			 "3-4 DWELLINGS/ACRE"	A	0.19	0.98	0.600	32
TOTAL AREA (ACRES) =	4897.4					 SUBAREA AVERAGE PERVIOUS	LOSS RAT	E, Fp(INC	H/HR) = 0	.75	
LONGEST FLOWPATH FROM	NODE 20120.0	00 TO NOD	E 20452.	00 = 2709	96.44 FEET.	 SUBAREA AVERAGE PERVIOUS	AREA FRA	ACTION, Ap	= 0.440		
						 SUBAREA AREA(ACRES) = !	54.32				
COMPUTED CONFLUENCE ES	TIMATES ARE A	AS FOLLOW	IS:			 UNIT-HYDROGRAPH DATA:					
UNIT-HYDROGRAPH DATA:						 RAINFALL(INCH): 5M= 0.39	;30M= 0.8	81;1H= 1.0°	7;3H= 1.85	;6H= 2.63;	24H= 5.90
RAINFALL(INCH): 5M= 0.	39;30M= 0.81;	;1H= 1.07	;3H= 1.86	;6H= 2.64;2	24H= 5.91	 S-GRAPH: VALLEY(DEV.) = 49	9.7%; VALI	LEY (UNDEV.)	/DESERT=	50.3%	
S-GRAPH: VALLEY (DEV.) =	49.2%; VALLEY	Y (UNDEV.)	/DESERT=	50.8%		 MOUNTAIN= 0.0%	; FOOTHILI	_= 0.0%;DI	ESERT (UNDE	U.)= 0.0%	
MOUNTAIN= 0.	0%; FOOTHILL=	0.0%;DE	SERT (UNDE	V.)= 0.0%		 Tc(HR) = 0.79; LAG(HR) =	0.63; Fn	n(INCH/HR)	= 0.56; Y	bar = 0.56	
Tc(HR) = 0.76; LAG(HR)						 USED SIERRA MADRE DEPTH-	AREA CURV	ES WITH AN	AC II CON	DITION.	
USED SIERRA MADRE DEPT						 DEPTH-AREA FACTORS: 5M =	0.78: 30	M = 0.78:	1HR = 0.7	8:	
DEPTH-AREA FACTORS: 5M						 3HR = 0.97; 6HR = 0.98;				-,	
3HR = 0.97; 6HR = 0.98				-,		 UNIT-INTERVAL(MIN) = 5.0			RES) =	5398.4	
UNIT-INTERVAL (MIN) =			(ES) =	5344.1		 LONGEST FLOWPATH FROM NO					91.93 FEET.
LONGEST FLOWPATH FROM					96.44 FEET	EOUIVALENT BASIN FACTOR			_0.00.		
EOUIVALENT BASIN FACT				270.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Lca/L=0.3,n=.0324; Lca/l			/I.=0 5 n=	0267:T.ca/T	=0 6.n= 0249
Lca/L=0.3,n=.0345; Lc			T.=0 5 n=	0284:T.ca/T	=0 6.n= 0265	TIME OF PEAK FLOW(HR) = 1					0.0/11 .0217
TIME OF PEAK FLOW(HR)	•				0.0,110203	UNIT-HYDROGRAPH PEAK FLOW				1217.22	
PEAK FLOW RATE (CFS) =		OLI VOLUM	m (vr.) =	1200.07			W KAIL(CE 5398.4			CFS) =	3127 //
FEAR FLOW RATE (CFS) =	J14/.44									(cro) =	J171.44
********		++++++++		+++++++++		NOTE: PEAK FLOW RATE DEF	AULIED TO	OPSIKEAM	VALUE		
						OUDADES SPES STEERSCES ST	TMD277	DMII / 733013			
FLOW PROCESS FROM NODE						SUBAREA AREA-AVERAGED RA				0.05.00	
						5M = 0.36; 30M = 0.74; 11	нк = 0.97	; 3HR = 1.	. 63; 6HR =	2.27; 24H	R = 4.72

Date: 04/21/2014 File name: LR0204ZZ.RES Page 35 Date: 04/21/2014 File name: LR0204ZZ.RES Page 36 \* FLOW PROCESS FROM NODE 20453.00 TO NODE 20454.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1395.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3128.68 CHANNEL SLOPE = 0.0144 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00 CHANNEL FLOW THRU SUBAREA (CFS) = 3127.44 FLOW VELOCITY (FEET/SEC.) = 26.50 FLOW DEPTH (FEET) = 5.25 TRAVEL TIME (MIN.) = 1.97 Tc (MIN.) = 49.44LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc (MIN.) = 49.44\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.089 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE SCHOOL в 17.44 0.75 0.600 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 3.70 0.75 0.600 56 PUBLIC PARK 9.17 0.75 0.850 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" В 5.37 0.75 0.500 COMMERCIAL В 1.64 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625 SUBAREA AREA(ACRES) = 37.32 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.39;30M= 0.81;1H= 1.06;3H= 1.85;6H= 2.63;24H= 5.89 S-GRAPH: VALLEY(DEV.) = 50.1%; VALLEY(UNDEV.) / DESERT = 49.9% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.82; LAG(HR) = 0.66; Fm(INCH/HR) = 0.55; Ybar = 0.56 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.78; 30M = 0.78; 1HR = 0.78; 3HR = 0.97; 6HR = 0.98; 24HR = 0.99UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 5435.8 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0309; Lca/L=0.4,n=.0277; Lca/L=0.5,n=.0255; Lca/L=0.6,n=.0238 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1221.26 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3044.93 TOTAL AREA (ACRES) = 5435.8 PEAK FLOW RATE (CFS) = 3127.44NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.72

FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 152

Date: 04/21/2014 File name: LR0204ZZ.RES Page 37

>>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<

\_\_\_\_\_

PEAK FLOWRATE TABLE FILE NAME: 20454.DNA

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 5435.8 TC (MIN.) = 49.44

AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56

PEAK FLOW RATE (CFS) = 3127.44

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0204ZZ.RES Page 38

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20539

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0205ZZ.DAT

TIME/DATE OF STUDY: 08:12 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9700

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	============	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0313	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0313	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 18 19	20.0 26.0 52.0	10.0 15.0 20.0	0.020/0.020/ 0.020/0.020/ 0.020/0.020/	0.020 0.020 0.020	0.50 0.67 0.67	1.50 2.00 2.00	0.0312 ( 0.0312 ( 0.0312 (	0.125 0.167 0.167	0.0180 0.0180 0.0180
1 2 *SI OR	as (Ma as (Ma 2. (Depth ZE PIPE R EQUAL 1	ive Flow-I aximum Ali n)*(Veloc: WITH A FI TO THE UPS	DEPTH CONSTRAI Depth = 0.20 lowable Street ity) Constrain LOW CAPACITY G STREAM TRIBUTA IMUM TOPOGRAPH	FEET Flow De t = 6.0 REATER T	O (FT*FT CHAN .*	/S)		CTED	
W U 1 F P S	JATERSHEI JSED "VAI UNITS/A OR DEVEI PRECIPITA SIERRA MA	D LAG = 0. LLEY UNDEN ACRE AND 1 LOPMENTS ( ATION DATA ADRE DEPTE	EL SELECTIONS/ .80 * TC VELOPED" S-GRA LESS; AND "VAL DF 2 UNITS/ACR A ENTERED ON S H-AREA FACTORS CONDITION (AM	LPH FOR I LEY DEVE E AND MO UBAREA E USED.	DEVELOPM ELOPED" DRE. BASIS.	S-GRA	PH	GRAPH	METHOD'
			*****						*****
F.TO	W PROCES	SS FROM NO	ODE 20500.00	TO NODE	20501.	00 IS			
			D INITIAL SUBA	REA ANAI	LYSIS<<<	<<			
	JSE TIME-	-OF-CONCEI	NTRATION NOMOG	RAPH FOR	RINITIA	L SUB	AREA<<		
			NTRATION NOMOG						=====
INI	TIAL SUE	======= BAREA FLOV	 W-LENGTH (FEET)	= 672	====== 2.35	=====	======		
INI	TIAL SUE	======= BAREA FLOV		= 672	====== 2.35	=====	======		
INI ELE Tc	TIAL SUE VATION I	BAREA FLOW DATA: UPST	W-LENGTH(FEET) IREAM(FEET) = .00)/(ELEVATIO	= 672 1595.0	2.35 00 DOWN E)]**0.2	===== STREAI	======		
INI ELE Tc SUB	TIAL SUE VATION I = K*[(LE BAREA ANA	BAREA FLOW DATA: UPS' ENGTH** 3	W-LENGTH(FEET) IREAM(FEET) =  .00)/(ELEVATIC ED MINIMUM TC(	= 672 1595.0 N CHANGE MIN.) =	2.35 00 DOWN E)]**0.2	===== STREAI	======		
INI ELE Tc SUB	TIAL SUE VATION I = K*[(LE BAREA ANA 25 YEAR	BAREA FLOW DATA: UPST ENGTH** 3 ALYSIS USI RAINFALL	W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATIC ED MINIMUM TC ( INTENSITY (INC	= 672 1595.0 ON CHANGE MIN.) = CH/HR) =	2.35 00 DOWN E)]**0.2	===== STREAI	======		
INI ELE Tc SUB *	TIAL SUE VATION I = K*[(LE BAREA ANZ 25 YEAR BAREA TC	BAREA FLOW DATA: UPS' ENGTH** 3 ALYSIS USI RAINFALL AND LOSS	W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATIC ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC	= 672 1595.0 ON CHANGE MIN.) = 2H/HR) = 2: II):	2.35 00 DOWN E)]**0.2 15.52 2.183	STREAM 0 5	======= M(FEET) =	= 15	91.00
INI ELE TC SUB * SUB DE	TIAL SUE VATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC VELOPMEN LAND U	BAREA FLOW DATA: UPST ENGTH** 3 ALYSIS USH RAINFALL AND LOSS WT TYPE/ JSE	W-LENGTH (FEET) TREAM (FEET) = .00) / (ELEVATIC ED MINIMUM TC ( INTENSITY (INC	= 672 1595.0 NN CHANGE MIN.) = 'H/HR) = ': II): AREA	2.35 00 DOWN E)]**0.2 15.52 2.183	STREAL 0 5	======================================	= 15 SCS	91.00 Tc
INI ELE TC SUB * SUB DE	TIAL SUE VATION I  K* [ (LE BAREA ANA 25 YEAR BAREA TC VELOPMEN LAND U BIDENTIAL	BAREA FLOW DATA: UPST ENGTH** 3. ALYSIS USH RAINFALL AND LOSS NT TYPE/ USE	W-LENGTH (FEET) TREAM (FEET) =  .00) / (ELEVATIO ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP	= 672 1595.0 NN CHANGE MIN.) = H/HR) = H: II): AREA (ACRES)	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/	STREAM  0  5  HR)	M(FEET) = Ap (DECIMAL)	= 15 SCS CN	91.00 Tc (MIN.)
INI ELE TC SUB * SUB DE RES RES	TIAL SUE CVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC CVELOPMEN LAND U BIDENTIAL 4 DWELLI GIDENTIAL	BAREA FLOW DATA: UPS' ENGTH** 3 ALYSIS USI RAINFALL AND LOSS WI TYPE/ JSE LINGS/ACRE	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATIC ED MINIMUM Tc ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B	= 672 1595.0 DN CHANGE MIN.) = CH/HR) = : II): AREA (ACRES)	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/	STREAM 0 5 HR)	Ap (DECIMAL)	= 15 SCS CN	91.00 Tc (MIN.
INI ELE TC SUB * SUB DE RES "3- RES	TIAL SUE CVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC VVELOPMEN LAND U BIDENTIAL 4 DWELLI BIDENTIAL	BAREA FLOW DATA: UPS' BALYSIS USI RAINFALL AND LOSS VISE LINGS/ACRE'	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATIC ED MINIMUM Tc ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B  A	= 672 1595.0 DN CHANGE MIN.) = CH/HR) = : II): AREA (ACRES)	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/	STREAM 0 5 HR)	Ap (DECIMAL)	= 15 SCS CN	91.00 Tc (MIN.)
INI ELE TC SUB * SUB DE RES "3- RES "3- AGR	TIAL SUE CVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC CVELOPMEN LAND U BIDENTIAI 4 DWELLI GIDENTIAI 4 DWELLI RICULTURA	BAREA FLOW DATA: UPS' ENGTH** 3 ALYSIS USI RAINFALL AND LOSS WI TYPE/ JSE LINGS/ACRE	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATIC ED MINIMUM Tc ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B  A  DVER	= 672 1595.0 ON CHANGE MIN.) = CH/HR) = : II): AREA (ACRES) 2.95 0.88	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/ 0.	0 5 HR) 75 98	Ap (DECIMAL) 0.600 0.600	scs CN 56	91.00 Tc (MIN. 15.5
INI ELE TC SUB * SUB DE RES "3- RES "3- AGR "OR SUB SUB	TIAL SUE VATION I  = K*[(LE SAREA ANA 25 YEAR SAREA TC VELOPMEN LAND U SIDENTIAL 4 DWELLL SIDENTIAL 4 DWELLL SICULTURA CCHARDS" BAREA AVE BAREA AVE	BAREA FLOW DATA: UPS: ENGTH** 3 ALYSIS USI RAINFALL AND LOSS WI TYPE/ USE LINGS/ACRE LINGS/ACRE LINGS/ACRE CERAGE PERV ERAGE PERV	W-LENGTH (FEET) PREAM (FEET) =  .00) / (ELEVATION   ED MINIMUM TC ( INTENSITY (INC. RATE DATA (AMC. SCS SOIL GROUP  B  A  DVER A  VIOUS LOSS RAT VIOUS AREA FRA	= 672 1595.0 NN CHANGE MIN.) = H/HR) = II): AREA (ACRES) 2.95 0.88 0.12 EE, Fp(IN	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/	STREAM 0 5 HR) 75 98 88 = 0.8	Ap (DECIMAL) 0.600 0.600 1.000	scs CN 56	91.00 Tc (MIN. 15.5
INI ELEE  TC SUB * SUB DE  RES "3- RES "3- AGR "OR SUB SUB SUB SUB SUB	TIAL SUE CVATION I  = K*[(LE CVATION I  25 YEAR CVELOPMEN LAND U  LAND U  SIDENTIAL 4 DWELLI CULTURA CCHARDS" BAREA AVE BAREA AVE BAREA AVE BAREA RUN	BAREA FLOW DATA: UPS: BAREA FLOW DATA: UPS: BALYSIS USI RAINFALL AND LOSS NT TYPE/ JUSE LINGS/ACRE' LI	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATION ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B A DVER A VIOUS LOSS RAT VIOUS AREA FRA = 6.01	= 672 1595.0 NN CHANGE MIN.) = H/HR) = II): AREA (ACRES) 2.95 0.88 0.12 E, Fp(IN CTION, F	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/ 0. 0. NCH/HR) Ap = 0.	STREAM 0 5 HR) 75 98 88 = 0.8	Ap (DECIMAL) 0.600 0.600 1.000 80	SCS CN 56 32 44	91.00 Tc (MIN. 15.5
INI ELEE  TC SUB * SUB DE  RES "3- RES "3- AGR "OR SUB SUB SUB SUB SUB	TIAL SUE CVATION I  = K*[(LE CVATION I  25 YEAR CVELOPMEN LAND U  LAND U  SIDENTIAL 4 DWELLI CULTURA CCHARDS" BAREA AVE BAREA AVE BAREA AVE BAREA RUN	BAREA FLOW DATA: UPS: BAREA FLOW DATA: UPS: BALYSIS USI RAINFALL AND LOSS NT TYPE/ JUSE LINGS/ACRE' LI	W-LENGTH (FEET) PREAM (FEET) =  .00) / (ELEVATION   ED MINIMUM TC ( INTENSITY (INC. RATE DATA (AMC. SCS SOIL GROUP  B  A  DVER A  VIOUS LOSS RAT VIOUS AREA FRA	= 672 1595.0 NN CHANGE MIN.) = H/HR) = II): AREA (ACRES) 2.95 0.88 0.12 E, Fp(IN CTION, F	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/ 0. 0. NCH/HR) Ap = 0.	STREAM 0 5 HR) 75 98 88 = 0.8	Ap (DECIMAL) 0.600 0.600 1.000 80	SCS CN 56 32 44	91.00 Tc (MIN. 15.5
INI ELE TC SUB * SUB DE RES "3- RES "3- AGR "OR SUB	TIAL SUE VATION I  = K*[(LE SAREA ANA 25 YEAR SAREA TC VELOPMEN LAND U SIDENTIAL 4 DWELLI SIDENTIAL 4 DWELLI SICULTURA CHARDS" SAREA AVE SAREA AVE SAREA RUN CAL AREA	BAREA FLOW DATA: UPS: BAREA FLOW DATA: UPS: BALYSIS USI RAINFALL AND LOSS NT TYPE/ USE LINGS/ACRE' LINGS/ACRE' LINGS/ACRE' ERAGE PERV BERAGE PERV BERAGE PERV BOFF (CFS) (ACRES) =	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATION ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B A DVER A VIOUS LOSS RAT VIOUS AREA FRA = 6.01	= 672 1595.0 N CHANGE MIN.) = H/HR) = II): AREA (ACRES) 2.95 0.88 0.12 E, Fp(IN CCTION, F	2.35 00 DOWN E)]**0.2 15.52 2.183 Fp (INCH/ 0. 0. NCH/HR) Ap = 0. V RATE (C	STREAM 0 5 HR) 75 98 88 = 0.8 612 FS) =	Ap (DECIMAL) 0.600 0.600 1.000 80	SCS CN 56 32 44	91.00  TC (MIN.)  15.55  26.60
INI ELE TC SUB * SUB DE RESS "3- AGR "OR SUB SUB TOT SUB 5M	TIAL SUE EVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL 4 DWELLD BIDENTIAL 4 DWELLD BICULTURA CHARDS" BAREA AVE BAREA A	BAREA FLOW DATA: UPS' BAREA FLOW DATA: UPS' BAINFALL AND LOSS VISE LINGS/ACRE'	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATIC ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B A DVER A VIOUS LOSS RAT VIOUS AREA FRA = 6.01 3.95 F ED RAINFALL DE 74; 1HR = 0.97	= 672 1595.0 ON CHANGE MIN.) = 2H/HR)	2.35 00 DOWN 2)]**0.2 15.52 2.183 Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C	STREAM 055  HR) 75 98 88 = 0.8 612  FS) = HR = 3 ******	Ap (DECIMAL) 0.600 0.600 1.000 80 6.0	SCS CN 56 32 44 D1 HR = 4	91.00  Tc (MIN.) 15.55 26.66
INI ELE TC SUB * SUB DE RES "3- AGR "OR SUB SUB TOT SUB 5M	TIAL SUE EVATION I  = K*[(LE BAREA ANA 25 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL 4 DWELLI BIDENTIAL 4 DWELLI BICULTURA CHARDS" BAREA AVE BAREA A	BAREA FLOW DATA: UPS' BAREA FLOW DATA: UPS' BALLYSIS USE RAINFALL AND LOSS VISE LINGS/ACRE' LINGS/ACRE	W-LENGTH (FEET) IREAM (FEET) =  .00) / (ELEVATIC ED MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP  B A DVER A VIOUS LOSS RAT VIOUS AREA FRA = 6.01 3.95 F  ED RAINFALL DE 74; 1HR = 0.97	= 672 1595.0 ON CHANGE MIN.) = 2H/HR)	2.35 00 DOWN 2)]**0.2 15.52 2.183 Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C	STREAM 0 5 5	Ap (DECIMAL) 0.600 0.600 1.000 80 6.0	SCS CN 56 32 44 D1 HR = 4	91.00  Tc (MIN.) 15.55 26.66

Date: 04/21/2014 File name: LR0205ZZ.RES Page 1 Date: 04/21/2014 File name: LR0205ZZ.RES Page 2

```
STREET LENGTH (FEET) = 262.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
                                                                                 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.54
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   ***STREET FLOW SPLITS OVER STREET-CROWN***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  FULL DEPTH (FEET) = 0.49 FLOOD WIDTH (FEET) = 18.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  FULL HALF-STREET VELOCITY (FEET/SEC.) = 4.06
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                  SPLIT DEPTH(FEET) = 0.23 SPLIT FLOOD WIDTH(FEET) = 5.44
                                                                                  SPLIT FLOW(CFS) = 0.91 SPLIT VELOCITY(FEET/SEC.) = 2.19
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.75
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH(FEET) = 0.49
   STREET FLOW DEPTH (FEET) = 0.46
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 18.00
   HALFSTREET FLOOD WIDTH (FEET) = 16.48
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.09
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.41
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 18.16
 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 16.94
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.987
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.071
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 2.45
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                   в 1.73
                                                0.600 56
 "3-4 DWELLINGS/ACRE" B 3.30
                                        0.75
                                                                                                                        0.75
                                                                                                                                0.250
                                                                                 MOBILE HOME PARK
 RESIDENTIAL
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" A 0.21 0.98
 "3-4 DWELLINGS/ACRE" A 0.37
                                        0.98
                                                0.600
                                                      32
                                                                                                                                0.600
                                                                                                        A 0.20 0.98 0.250
 AGRICULTURAL FAIR COVER
                                                                                 MOBILE HOME PARK
 "ORCHARDS"
                       A
                           0.16 0.88 1.000 44
                                                                                 AGRICULTURAL FAIR COVER
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
                                                                                 "ORCHARDS"
                                                                                                             0.11 0.88 1.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.617
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AREA (ACRES) = 3.83 SUBAREA RUNOFF (CFS) = 5.49
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466
 EFFECTIVE AREA(ACRES) = 7.78 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 SUBAREA AREA (ACRES) = 4.70 SUBAREA RUNOFF (CFS) = 6.88
 AREA-AVERAGED Fp(INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.61
                                                                                 EFFECTIVE AREA (ACRES) = 12.48 AREA-AVERAGED Fm (INCH/HR) = 0.44
 TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) = 11.10
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.56
                                                                                 TOTAL AREA (ACRES) = 12.5 PEAK FLOW RATE (CFS) = 17.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 3.26 DEPTH*VELOCITY (FT*FT/SEC.) = 1.59
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20502.00 = 935.03 FEET.
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.06 DEPTH*VELOCITY (FT*FT/SEC.) = 1.97
                                                                                 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20503.00 = 1231.69 FEET.
******************
                                                                               ******************
 FLOW PROCESS FROM NODE 20502.00 TO NODE 20503.00 IS CODE = 63
______
                                                                                 FLOW PROCESS FROM NODE 20503.00 TO NODE 20504.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
______
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1587.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                               _____
 STREET LENGTH (FEET) = 296.66 CURB HEIGHT (INCHES) = 6.0
                                                                                 UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 STREET LENGTH (FEET) = 416.03 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

56

56

32

32

Date: 04/21/2014 File name: LR0205ZZ.RES Page 3 Date: 04/21/2014 File name: LR0205ZZ.RES Page 4

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  29.73
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.12
 STREET FLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 21.34
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.803
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.33 0.75 0.600
                                                         56
                     B 1.58 0.75 0.250 56
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.506
 SUBAREA AREA (ACRES) = 5.91 SUBAREA RUNOFF (CFS) = 7.58
 EFFECTIVE AREA(ACRES) = 24.81 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) = 32.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.01
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 2.23
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20505.00 = 2035.25 FEET.
******************
 FLOW PROCESS FROM NODE 20505.00 TO NODE 20506.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1560.00 DOWNSTREAM ELEVATION(FEET) = 1535.00
 STREET LENGTH (FEET) = 1240.51 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    41.72
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Page 6

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0205ZZ.RES Page 5

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1

```
STREET FLOW DEPTH(FEET) = 0.55
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 3.33 Tc (MIN.) = 29.24
   HALFSTREET FLOOD WIDTH (FEET) = 20.58
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.50
 STREET FLOW TRAVEL TIME (MIN.) = 4.56 Tc (MIN.) = 25.90
                                                                                     LAND USE
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.606
                                                                                 RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               αA
                                                                                 RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.33 0.75 0.600 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.53 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 18.86 SUBAREA RUNOFF (CFS) = 19.08
 EFFECTIVE AREA(ACRES) = 43.67 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 43.7 PEAK FLOW RATE (CFS) = 46.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.49
 FLOW VELOCITY (FEET/SEC.) = 4.70 DEPTH*VELOCITY (FT*FT/SEC.) = 2.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1240.5 FT WITH ELEVATION-DROP = 25.0 FT, IS 28.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20506.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20506.00 = 3275.76 FEET.
*****
 FLOW PROCESS FROM NODE 20506.00 TO NODE 20507.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1535.00 DOWNSTREAM ELEVATION(FEET) = 1518.00
 STREET LENGTH (FEET) = 947.01 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.08
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.74
                                                                                 RESTDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.85
```

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.493
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" B 6.54 0.75 0.600
 "3-4 DWELLINGS/ACRE" A 9.86 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 16.40 SUBAREA RUNOFF (CFS) = 14.21
 EFFECTIVE AREA(ACRES) = 60.07 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.55
 TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) =
                                                        56.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.51
 FLOW VELOCITY (FEET/SEC.) = 4.80 DEPTH*VELOCITY (FT*FT/SEC.) = 2.93
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20507.00 = 4222.77 FEET.
******************
 FLOW PROCESS FROM NODE 20507.00 TO NODE 20508.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1490.50
 STREET LENGTH (FEET) = 1523.12 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  63.49
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.63
  HALFSTREET FLOOD WIDTH (FEET) = 24.54
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.97
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.13
 STREET FLOW TRAVEL TIME (MIN.) = 5.11 Tc (MIN.) = 34.35
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.356
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                αA
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" B 11.25 0.75 0.600 56
```

```
RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" A 6.62 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 17.87 SUBAREA RUNOFF(CFS) = 13.77
 EFFECTIVE AREA(ACRES) = 77.94 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 77.9
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 24.48
 FLOW VELOCITY (FEET/SEC.) = 4.95 DEPTH*VELOCITY (FT*FT/SEC.) = 3.12
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20508.00 = 5745.89 FEET.
FLOW PROCESS FROM NODE 20508.00 TO NODE 20509.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1490.50 DOWNSTREAM ELEVATION (FEET) = 1490.00
 STREET LENGTH (FEET) = 621.21 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.06
   HALFSTREET FLOOD WIDTH (FEET) = 45.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.63
 STREET FLOW TRAVEL TIME (MIN.) = 6.75 Tc (MIN.) = 41.09
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.217
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.36
                                        0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 2.36 SUBAREA RUNOFF (CFS) = 1.34
 EFFECTIVE AREA(ACRES) = 80.30 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 80.3 PEAK FLOW RATE (CFS) = 62.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.06 HALFSTREET FLOOD WIDTH(FEET) = 45.47
 FLOW VELOCITY (FEET/SEC.) = 1.53 DEPTH*VELOCITY (FT*FT/SEC.) = 1.62
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20509.00 = 6367.10 FEET.
*******************
 FLOW PROCESS FROM NODE 20509.00 TO NODE 20518.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1489.50
 STREET LENGTH (FEET) = 654.22 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.07
   HALFSTREET FLOOD WIDTH (FEET) = 46.08
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.61
 STREET FLOW TRAVEL TIME (MIN.) = 7.25 Tc (MIN.) = 48.35
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.104
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.47 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 2.47 SUBAREA RUNOFF (CFS) = 1.15
 EFFECTIVE AREA(ACRES) = 82.77 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 82.8 PEAK FLOW RATE (CFS) =
                                                           62.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 1.06 HALFSTREET FLOOD WIDTH (FEET) = 45.89
 FLOW VELOCITY (FEET/SEC.) = 1.50 DEPTH*VELOCITY (FT*FT/SEC.) = 1.60
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
```

Page 10

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014 File name: LR0205ZZ.RES Page 9

```
*************************
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
                                                                           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 TOTAL NUMBER OF STREAMS = 2
                                                                           STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                           Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 TIME OF CONCENTRATION (MIN.) = 48.35
                                                                           Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 RAINFALL INTENSITY (INCH/HR) = 1.10
                                                                           MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                             **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 AREA-AVERAGED Fp(INCH/HR) = 0.83
 AREA-AVERAGED Ap = 0.56
                                                                             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 EFFECTIVE STREAM AREA(ACRES) = 82.77
                                                                             STREET FLOW DEPTH (FEET) = 0.38
 TOTAL STREAM AREA(ACRES) = 82.77
                                                                             HALFSTREET FLOOD WIDTH (FEET) = 11.09
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  62.94
                                                                             AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.07
                                                                             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.55
*******************
                                                                           STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 10.93
 FLOW PROCESS FROM NODE 20510.00 TO NODE 20511.00 IS CODE = 21
                                                                            * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.694
______
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                                             Fp
                                                                                                                       Αp
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                               LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
_____
                                                                           AGRICULTURAL FAIR COVER
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.77
                                                                            "ORCHARDS"
                                                                                                 A
                                                                                                      1.59 0.88
                                                                                                                       1.000
 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1590.00
                                                                           AGRICULTURAL FAIR COVER
                                                                            "ORCHARDS"
                                                                                                 B 2.00
                                                                                                                0.63
                                                                                                                       1.000
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                           RESIDENTIAL
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.909
                                                                           "3-4 DWELLINGS/ACRE" B 0.46
                                                                                                                0.75
                                                                                                                       0.600
                                                                                                        0.58
                                                                                                                       0.250
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.858
                                                                           MOBILE HOME PARK
                                                                                                 В
                                                                                                                0.75
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.866
                                                    SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                            SUBAREA AREA (ACRES) = 4.63 SUBAREA RUNOFF (CFS) = 8.55
 RESIDENTIAL
                                                                            EFFECTIVE AREA(ACRES) = 8.30 AREA-AVERAGED Fm(INCH/HR) = 0.65
 "3-4 DWELLINGS/ACRE" A
                             0.24
                                      0.98
                                             0.600 32 13.43
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.88
 AGRICULTURAL FAIR COVER
                                                                            TOTAL AREA (ACRES) = 8.3
                                                                                                        PEAK FLOW RATE(CFS) =
 "ORCHARDS"
                             0.98
                                      0.88
                                             1.000
                                                   44 23.01
                      Α
 RESIDENTIAL
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "3-4 DWELLINGS/ACRE" B
                             0.57
                                      0.75
                                             0.600
                                                   56 13.43
                                                                            5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                             1.82
                                      0.63
                                            1.000
                                                   65 23.01
                       В
                                                                           END OF SUBAREA STREET FLOW HYDRAULICS:
 COMMERCIAL
                      В
                             0.06
                                      0.75
                                             0.100 56 9.91
                                                                           DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 12.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                           FLOW VELOCITY (FEET/SEC.) = 4.37 DEPTH*VELOCITY (FT*FT/SEC.) = 1.78
                                                                           LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20512.00 = 818.18 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA RUNOFF (CFS) = 7.27
                                                                          ******************
                     3.67 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                                                                            FLOW PROCESS FROM NODE 20512.00 TO NODE 20513.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          ______
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                           >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                           >>>> (STREET TABLE SECTION # 18 USED) <<<<
*****************
                                                                          _____
 FLOW PROCESS FROM NODE 20511.00 TO NODE 20512.00 IS CODE = 63
                                                                            UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1575.00
-----
                                                                           STREET LENGTH (FEET) = 306.50 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                           STREET HALFWIDTH (FEET) = 26.00
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
                                                                           DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                           INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 249.41 CURB HEIGHT (INCHES) = 8.0
                                                                           OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
```

11.55

SCS

44

6.5

56

15.28

Date: 04/21/2014 Page 12 Date: 04/21/2014 File name: LR020577.RFS Page 11 File name: LR020577.RFS

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    37.35
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98
                                                                                   STREET FLOW DEPTH (FEET) = 0.62
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 22.98
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.41
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.11
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.51
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.03 Tc (MIN.) = 14.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.53
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.276
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.37
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
                                                                                                                                         SCS
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 12.45
                                                                                  MOBILE HOME PARK
                                                                                                     A 3.78 0.98 0.250
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.492
                                                                                                                                         32
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  MOBILE HOME PARK
                                                                                                       В
                                                                                                               6.42
                                                                                                                          0.75 0.250
                                                                                                                                         56
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ap SCS
                                                                                  RESIDENTIAL
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "3-4 DWELLINGS/ACRE" B 0.82 0.75 0.600
 AGRICULTURAL FAIR COVER
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 "ORCHARDS"
                    A
                              1.37
                                        0.88
                                               1.000 44
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.276
 MOBILE HOME PARK A 1.25
                                         0.98
                                                 0.250 32
                                                                                  SUBAREA AREA(ACRES) = 11.02 SUBAREA RUNOFF(CFS) = 20.33
 AGRICULTURAL FAIR COVER
                                                                                  EFFECTIVE AREA(ACRES) = 26.50 AREA-AVERAGED Fm(INCH/HR) = 0.41
 "ORCHARDS"
                      В 1.07
                                         0.63
                                                 1.000 65
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.53
                      В
 MOBILE HOME PARK
                              2.91
                                         0.75
                                                 0.250 56
                                                                                  TOTAL AREA(ACRES) = 26.5 PEAK FLOW RATE(CFS) =
                                                                                                                                          44.51
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.58
                                      0.75 0.600 56
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
                                                                                  5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.533
 SUBAREA AREA (ACRES) = 7.18 SUBAREA RUNOFF (CFS) = 13.42
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 15.48 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                  DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.62
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.56 DEPTH*VELOCITY (FT*FT/SEC.) = 2.32
 TOTAL AREA (ACRES) = 15.5 PEAK FLOW RATE (CFS) = 27.19
                                                                                  LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20514.00 = 1541.21 FEET.
                                                                                ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                                  FLOW PROCESS FROM NODE 20514.00 TO NODE 20515.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.12
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 3.54 DEPTH*VELOCITY (FT*FT/SEC.) = 1.91
                                                                                ______
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20513.00 = 1124.68 FEET.
                                                                                  UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1565.00
                                                                                  STREET LENGTH (FEET) = 392.53 CURB HEIGHT (INCHES) = 8.0
*****************
                                                                                  STREET HALFWIDTH (FEET) = 26.00
 FLOW PROCESS FROM NODE 20513.00 TO NODE 20514.00 IS CODE = 63
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1575.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 416.53 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    53.54
                                                                                   ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.68
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 26.67
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.82
```

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06

Date: 04/21/2014

File name: LR0205ZZ.RES

Page 14

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

Date: 04/21/2014

File name: LR0205ZZ.RES

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.60
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                       B 20.48 0.75 0.600
                                                                                                                                       56
 STREET FLOW TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 16.19
                                                                                RESIDENTIAL
                                                                                                     A 2.53 0.98 0.600
                                                                                                                                       32
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.129
                                                                                "3-4 DWELLINGS/ACRE"
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                MOBILE HOME PARK
                                                                                                       B 12.12
                                                                                                                       0.75 0.250 56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
                                       Fρ
                                                Αp
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.479
                    B 5.83
                                                0.250 56
 MOBILE HOME PARK
                                        0.75
                                                                                SUBAREA AREA(ACRES) = 35.13 SUBAREA RUNOFF(CFS) = 48.22
                                                                                EFFECTIVE AREA (ACRES) = 72.64 AREA-AVERAGED Fm (INCH/HR) = 0.37
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.98
                                        0.75
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.49
                                                0.600 56
                               0.20
                                        0.98 0.250 32
                                                                                TOTAL AREA (ACRES) = 72.6 PEAK FLOW RATE (CFS) =
 MOBILE HOME PARK A
                                                                                                                                        99.32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 11.01 SUBAREA RUNOFF (CFS) = 18.06
                                                                                5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 EFFECTIVE AREA(ACRES) = 37.51 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.50
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA(ACRES) = 37.5 PEAK FLOW RATE(CFS) =
                                                                                DEPTH (FEET) = 0.72 HALFSTREET FLOOD WIDTH (FEET) = 28.50
                                                         59.04
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.20 DEPTH*VELOCITY (FT*FT/SEC.) = 4.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20516.00 = 3149.32 FEET.
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 FLOW PROCESS FROM NODE 20516.00 TO NODE 20517.00 IS CODE = 63
                                                                               ______
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.52
 FLOW VELOCITY (FEET/SEC.) = 3.95 DEPTH*VELOCITY (FT*FT/SEC.) = 2.76
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20515.00 = 1933.74 FEET.
                                                                                >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                               ______
************************
                                                                                UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1510.00
 FLOW PROCESS FROM NODE 20515.00 TO NODE 20516.00 IS CODE = 63
                                                                                STREET LENGTH (FEET) = 1115.01 CURB HEIGHT (INCHES) = 8.0
______
                                                                                STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
_____
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1565.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 1215.58 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.95
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.65
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREET FLOW DEPTH(FEET) = 0.80
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 32.59
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.60
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.47
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   83.21
   ***STREET FLOWING FULL***
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 3.32 Tc (MIN.) = 23.00
                                                                                * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.724
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 26.97
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                      SCS
                                                                                                                       Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.81
                                                                                     LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.98
                                                                                RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 3.49 Tc (MIN.) = 19.68
                                                                                "3-4 DWELLINGS/ACRE" A 23.04 0.98
                                                                                                                               0.600
                                                                                                                                       32
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.893
                                                                                RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                     В 11.30
                                                                                                                       0.75
                                                                                                                               0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 RESIDENTIAL
                                                                                SUBAREA AREA(ACRES) = 34.34 SUBAREA RUNOFF(CFS) = 36.60
```

Page 16

Date: 04/21/2014 File name: LR0205ZZ.RES Page 15

```
EFFECTIVE AREA(ACRES) = 106.98 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.52
                                                                              DEPTH (FEET) = 0.87 HALFSTREET FLOOD WIDTH (FEET) = 36.25
 TOTAL AREA (ACRES) = 107.0 PEAK FLOW RATE (CFS) = 124.87
                                                                              FLOW VELOCITY (FEET/SEC.) = 5.65 DEPTH*VELOCITY (FT*FT/SEC.) = 4.93
                                                                               *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    AND L = 1340.0 FT WITH ELEVATION-DROP = 20.5 FT, IS 56.6 CFS,
                                                                                    WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20518.00
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                              LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20518.00 = 5604.37 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                             ******************
 DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 33.26
 FLOW VELOCITY (FEET/SEC.) = 5.70 DEPTH*VELOCITY (FT*FT/SEC.) = 4.63
                                                                              FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20517.00 = 4264.33 FEET.
                                                                             ______
                                                                              >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
*****
                                                                              >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 FLOW PROCESS FROM NODE 20517.00 TO NODE 20518.00 IS CODE = 63
                                                                             TOTAL NUMBER OF STREAMS = 2
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                              TIME OF CONCENTRATION (MIN.) = 26.97
_____
                                                                              RAINFALL INTENSITY (INCH/HR) = 1.57
 UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1489.50
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.47
 STREET LENGTH (FEET) = 1340.04 CURB HEIGHT (INCHES) = 8.0
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.86
 STREET HALFWIDTH (FEET) = 26.00
                                                                              AREA-AVERAGED Ap = 0.55
                                                                              EFFECTIVE STREAM AREA(ACRES) = 148.93
                                                                              TOTAL STREAM AREA(ACRES) = 148.93
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 147.34
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               ** CONFLUENCE DATA **
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                               NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               1
                                                                                       62.94 48.35 1.104 0.83(0.47) 0.56 82.8 20500.00
                                                                                 2 147.34 26.97 1.567 0.86(0.47) 0.55 148.9 20510.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99
                                                                              RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 143.68
                                                                              CONFLUENCE FORMULA USED FOR 2 STREAMS.
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              ** PEAK FLOW RATE TABLE **
   STREET FLOW DEPTH(FEET) = 0.86
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                               NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   HALFSTREET FLOOD WIDTH (FEET) = 35.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.63
                                                                                1
                                                                                        207.91 26.97 1.567 0.85(0.47) 0.55 195.1 20510.00
                                                                                       148.21 48.35 1.104 0.85(0.47) 0.55 231.7 20500.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.86
 STREET FLOW TRAVEL TIME (MIN.) = 3.97 Tc (MIN.) = 26.97
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.567
                                                                              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                              PEAK FLOW RATE (CFS) = 207.91 Tc (MIN.) = 26.97
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                              EFFECTIVE AREA(ACRES) = 195.10 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                    Fρ
                                              αA
                                                      SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.55
 RESIDENTIAL
                                                                              TOTAL AREA (ACRES) = 231.7
 "3-4 DWELLINGS/ACRE" A 37.81 0.98
                                               0.600 32
                                                                              LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.14 0.75 0.600 56
                                                                             ******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.95
                                                                              FLOW PROCESS FROM NODE 20518.00 TO NODE 20519.00 IS CODE = 33
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 41.95
                            SUBAREA RUNOFF (CFS) = 37.59
                                                                              >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 148.93 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                              >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.55
                                                                             ______
 TOTAL AREA (ACRES) = 148.9 PEAK FLOW RATE (CFS) = 147.34
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1489.50
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
                                                                              FLOW LENGTH (FEET) = 2632.61 MANNING'S N = 0.013
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                              USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
```

Page 17

Date: 04/21/2014

File name: LR020577.RFS

Date: 04/21/2014 File name: LR0205ZZ.RES Page 18

HEADWATER

```
DEPTH OF FLOW IN 60.0 INCH PIPE IS 32.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.88
                                                                                    >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 PIPE-FLOW(CFS) = 207.91
                                                                                   >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                  ______
 PIPEFLOW TRAVEL TIME (MIN.) = 2.47 Tc (MIN.) = 29.44
                                                                                    UPSTREAM NODE ELEVATION (FEET) = 1440.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.487
                                                                                   DOWNSTREAM NODE ELEVATION (FEET) = 1410.00
                                                                                   FLOW LENGTH (FEET) = 1552.52 MANNING'S N = 0.013
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                                   Дp
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
                                21.65
                                         0.98
                                                  0.600
                                                         32
                                                                                    DEPTH OF FLOW IN 66.0 INCH PIPE IS 33.8 INCHES
 SCHOOL
                       Α
 RESIDENTIAL
                                                                                    PIPE-FLOW VELOCITY (FEET/SEC.) = 19.84
 "3-4 DWELLINGS/ACRE"
                               27.03
                                          0.98
                                                  0.600
                                                         32
                      A
                                                                                   PIPE-FLOW(CFS) = 242.63
 MOBILE HOME PARK
                       A 8.46
                                          0.98
                                                  0.250
                                                                                    *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 SCHOOL
                            7.51
                                                  0.600 56
                                                                                    PIPEFLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 30.83
                         В
                                          0.75
 RESIDENTIAL
                                                                                    * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.446
                     В 5.29
 "3-4 DWELLINGS/ACRE"
                                          0.75 0.600 56
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
 MOBILE HOME PARK
                       В
                               2.31
                                         0.75
                                                  0.250 56
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                           Fρ
                                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
                                                                                        LAND USE
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
                                                                                    RESIDENTIAL
                                SUBAREA RUNOFF(CFS) = 63.64
                                                                                    "3-4 DWELLINGS/ACRE"
                                                                                                        A 13.85
 SUBAREA AREA(ACRES) = 72.25
                                                                                                                             0.98
                                                                                                                                    0.600
                                                                                                                                             32
 EFFECTIVE AREA(ACRES) = 267.35 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                                    SCHOOL
                                                                                                          Α
                                                                                                                  16.29
                                                                                                                            0.98
                                                                                                                                    0.600
                                                                                                                                             32
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.55
                                                                                    RESIDENTIAL
 TOTAL AREA (ACRES) = 304.0 PEAK FLOW RATE (CFS) = 242.63
                                                                                    "3-4 DWELLINGS/ACRE" B 15.89
                                                                                                                                             56
                                                                                                                            0.75
                                                                                                                                    0.600
                                                                                                                  9.87
                                                                                                                            0.75 0.850
                                                                                    PUBLIC PARK
                                                                                                           В 12.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    SCHOOL
                                                                                                                            0.75 0.600 56
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.636
                                                                                    SUBAREA AREA (ACRES) = 68.01 SUBAREA RUNOFF (CFS) = 55.70
 STREET CROSS-SECTION INFORMATION:
                                                                                    EFFECTIVE AREA(ACRES) = 335.36 AREA-AVERAGED Fm(INCH/HR) = 0.49
 CURB HEIGHT (INCHES) = 8.0
                           STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                    AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.57
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    TOTAL AREA (ACRES) = 372.0 PEAK FLOW RATE (CFS) = 288.59
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET CROSS-SECTION INFORMATION:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    CURB HEIGHT (INCHES) = 8.0
                                                                                                              STREET HALFWIDTH (FEET) = 26.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 34.72
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREET FLOW DEPTH(FEET) = 0.57
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   HALFSTREET FLOOD WIDTH (FEET) = 20.46
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.97
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.25
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
  ** PEAK FLOW RATE TABLE **
                                                                                    STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREAM
          0
                   Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                    STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 45.96
  NUMBER
            (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
           242.63 29.44 1.487 0.87 (0.48) 0.55 267.4 20510.00
    1
                                                                                     STREET FLOW DEPTH(FEET) = 0.61
     2
           161.94 51.03 1.069 0.87(0.48) 0.55 304.0 20500.00
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 22.75
 NEW PEAK FLOW DATA ARE:
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.28
 PEAK FLOW RATE (CFS) = 242.63 Tc (MIN.) = 29.44
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.63
 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.87
 AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 267.35
                                                                                   ** PEAK FLOW RATE TABLE **
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20519.00 = 9653.93 FEET.
                                                                                    STREAM Q Tc Intensity Fp(Fm) Ap
                                                                                                                                   Ae
                                                                                                                                            HEADWATER
                                                                                    NUMBER
                                                                                              (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                    (ACRES) NODE
*****************
                                                                                     1
                                                                                             288.59 30.83 1.446 0.87 (0.49) 0.57 335.4 20510.00
 FLOW PROCESS FROM NODE 20519.00 TO NODE 20520.00 IS CODE = 33
                                                                                             188.23 52.57 1.050 0.86(0.49) 0.57
                                                                                                                                      372.0 20500.00
```

Date: 04/21/2014 File name: LR0205ZZ.RES Page 19 Date: 04/21/2014 File name: LR0205ZZ.RES

```
NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 288.59 Tc (MIN.) = 30.83
                                                                                 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.87
 AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 335.36
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20520.00 = 11206.45 FEET.
*************************
 FLOW PROCESS FROM NODE 20520.00 TO NODE 20536.00 IS CODE = 33
_____
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                 AREA-AVERAGED Ap = 0.57
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1410.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
 FLOW LENGTH (FEET) = 1041.51 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 38.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.54
 PIPE-FLOW(CFS) =
                   288.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 31.83
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.419
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.22
                                        0.98
                                                0.600 32
 RESIDENTIAL
                                                                                     LAND USE
                    в 2.36 0.75
 "3-4 DWELLINGS/ACRE"
                                              0.600 56
                                                                                 RESIDENTIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
                                                                                 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.58 SUBAREA RUNOFF (CFS) = 4.48
 EFFECTIVE AREA(ACRES) = 340.94 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 377.5 PEAK FLOW RATE (CFS) = 288.59
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET.
******************
 FLOW PROCESS FROM NODE 20536.00 TO NODE 20536.00 IS CODE = 1
```

```
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 31.83
 RAINFALL INTENSITY (INCH/HR) = 1.42
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.87
 EFFECTIVE STREAM AREA(ACRES) = 340.94
 TOTAL STREAM AREA(ACRES) = 377.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 288.59
******************
 FLOW PROCESS FROM NODE 20530.00 TO NODE 20531.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 818.88
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1470.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.549
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.270
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Дp
                                                   SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                     A 5.33 0.98 0.600 32 14.55
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 8.08
 TOTAL AREA (ACRES) = 5.33 PEAK FLOW RATE (CFS) = 8.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
***********************
 FLOW PROCESS FROM NODE 20531.00 TO NODE 20532.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1470.00 DOWNSTREAM ELEVATION(FEET) = 1465.00
 STREET LENGTH (FEET) = 771.13 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
```

File name: LR0205ZZ.RES

Page 22

Date: 04/21/2014

Date: 04/21/2014 File name: LR020577.RFS Page 21

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fp
                                                                                                                           Ap
   ***STREET FLOWING FULL***
                                                                                  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              SCHOOL
                                                                                                  A 1.18 0.98 0.600
   STREET FLOW DEPTH(FEET) = 0.53
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" A 1.68 0.98 0.600 32
   HALFSTREET FLOOD WIDTH (FEET) = 19.60
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 STREET FLOW TRAVEL TIME (MIN.) = 5.25 Tc (MIN.) = 19.80
                                                                               SUBAREA AREA (ACRES) = 2.86 SUBAREA RUNOFF (CFS) = 3.09
                                                                               EFFECTIVE AREA(ACRES) = 29.27 AREA-AVERAGED Fm(INCH/HR) = 0.58
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.886
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                               TOTAL AREA (ACRES) = 29.3 PEAK FLOW RATE (CFS) =
                                                                                                                                  31.67
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 21.08
                                       0.98 0.600 32
                                                                               5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                             *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.08 SUBAREA RUNOFF(CFS) = 24.69
                                                                               FLOW PROCESS FROM NODE 20533.00 TO NODE 20534.00 IS CODE = 63
 EFFECTIVE AREA(ACRES) = 26.41 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 TOTAL AREA (ACRES) = 26.4 PEAK FLOW RATE (CFS) =
                                                       30.93
                                                                              >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             ______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               UPSTREAM ELEVATION(FEET) = 1455.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
                                                                               STREET LENGTH (FEET) = 1374.03 CURB HEIGHT (INCHES) = 6.0
                                                                               STREET HALFWIDTH (FEET) = 18.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.71
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 FLOW VELOCITY (FEET/SEC.) = 2.80 DEPTH*VELOCITY (FT*FT/SEC.) = 1.66
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
       AND L = 771.1 FT WITH ELEVATION-DROP = 5.0 FT, IS 29.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20532.00
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20532.00 = 1590.01 FEET.
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20532.00 TO NODE 20533.00 IS CODE = 42
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
______
                                                                                                                               48.87
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                ***STREET FLOWING FULL***
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 UPSTREAM NODE ELEVATION (FEET) = 1465.00
                                                                                STREET FLOW DEPTH(FEET) = 0.58
 DOWNSTREAM NODE ELEVATION (FEET) = 1455.00
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 22.22
 FLOW LENGTH (FEET) = 1024.14 MANNING'S N = 0.013
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.61
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.69
 USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 4.97 Tc (MIN.) = 26.64
 DEPTH OF FLOW IN 33.0 INCH PIPE IS 18.3 INCHES
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.579
 PIPE-FLOW VELOCITY (FEET/SEC.) = 9.17
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 PIPE-FLOW(CFS) = 30.93
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                 LAND USE
 PIPEFLOW TRAVEL TIME (MIN.) = 1.86 Tc (MIN.) = 21.67
                                                                               RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE" A 3.88 0.98 0.600 32
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20533.00 = 2614.15 FEET.
                                                                                                   A 34.43 0.98 0.600 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 FLOW PROCESS FROM NODE 20533.00 TO NODE 20533.00 IS CODE = 81
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                               SUBAREA AREA (ACRES) = 38.31 SUBAREA RUNOFF (CFS) = 34.27
                                                                               EFFECTIVE AREA(ACRES) = 67.58 AREA-AVERAGED Fm(INCH/HR) = 0.59
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
______
 MAINLINE Tc (MIN.) = 21.67
                                                                               TOTAL AREA (ACRES) = 67.6 PEAK FLOW RATE(CFS) = 60.45
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.787
```

SUBAREA LOSS RATE DATA (AMC II):

SCS

Date: 04/21/2014 Page 23 Date: 04/21/2014 File name: LR0205ZZ.RES File name: LR020577.RFS Page 24

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.05
 FLOW VELOCITY (FEET/SEC.) = 4.91 DEPTH*VELOCITY (FT*FT/SEC.) = 3.05
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 27.0 INCH PIPE IS 18.6 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.81
 PIPE-FLOW(CFS) = 31.67
 PIPEFLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 23.78
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.690
 SUBAREA AREA (ACRES) = 38.31 SUBAREA RUNOFF (CFS) = 38.10
 TOTAL AREA(ACRES) = 67.6 PEAK FLOW RATE(CFS) = 67.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 35.54
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.15
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.22
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20534.00 = 3988.18 FEET.
******************
 FLOW PROCESS FROM NODE 20534.00 TO NODE 20535.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1396.00
 STREET LENGTH (FEET) = 1929.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.60
 STREET FLOW TRAVEL TIME (MIN.) = 6.10 Tc (MIN.) = 29.88
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.474
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                       Fp
                                                          SCS
                                                   αA
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     A 35.20 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 35.20
                                SUBAREA RUNOFF (CFS) = 28.15
 EFFECTIVE AREA(ACRES) = 102.78 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) =
                                                           82.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.23
 FLOW VELOCITY (FEET/SEC.) = 5.28 DEPTH*VELOCITY (FT*FT/SEC.) = 3.62
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 9.52
 PIPE-FLOW(CFS) = 37.90
 PIPEFLOW TRAVEL TIME (MIN.) = 3.38 Tc (MIN.) = 27.16
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.561
 SUBAREA AREA (ACRES) = 35.20 SUBAREA RUNOFF (CFS) = 30.91
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 90.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 52.35
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.96
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.78
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20535.00 = 5917.68 FEET.
*******************
 FLOW PROCESS FROM NODE 20535.00 TO NODE 20536.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1396.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
 FLOW LENGTH (FEET) = 1300.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 47.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.58
 PIPE-FLOW(CFS) =
                   90.25
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 5.06 Tc (MIN.) = 32.22
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.409
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                          SCS
       Date: 04/21/2014 File name: LR0205ZZ.RES
                                                         Page 26
```

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" A 12.27 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.40 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA(ACRES) = 12.67 SUBAREA RUNOFF(CFS) = 9.44 EFFECTIVE AREA(ACRES) = 115.45 AREA-AVERAGED Fm(INCH/HR) = 0.58 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60 TOTAL AREA(ACRES) = 115.4 PEAK FLOW RATE(CFS) = 90.25 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE	** PEAK FLOW RATE TABLE **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 378.84 31.83 1.419 0.89 (0.51) 0.58 455.0 20510.00 2 377.04 32.22 1.409 0.89 (0.51) 0.58 457.1 20530.00 3 237.78 53.68 1.037 0.89 (0.51) 0.57 493.0 20500.00  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE (CFS) = 378.84 Tc (MIN.) = 31.83  EFFECTIVE AREA (ACRES) = 454.99 AREA-AVERAGED Fm (INCH/HR) = 0.51  AREA-AVERAGED Fp (INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.58  TOTAL AREA (ACRES) = 493.0  LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET.
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82	**************************************
STREET CROSS-SECTION INFORMATION:  CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00  INSIDE STREET CROSSFALL (DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section (curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;  STREET HYDRAULICS NOT COMPUTED*  LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20536.00 = 7218.31 FEET.  **********************************	>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 13.40 0.75 0.600 56
TOTAL NUMBER OF STREAMS = 2  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:  TIME OF CONCENTRATION (MIN.) = 32.22  RAINFALL INTENSITY(INCH/HR) = 1.41  AREA-AVERAGED FM (INCH/HR) = 0.58  AREA-AVERAGED FP (INCH/HR) = 0.97  AREA-AVERAGED AP = 0.60  EFFECTIVE STREAM AREA (ACRES) = 115.45  TOTAL STREAM AREA (ACRES) = 115.45  PEAK FLOW RATE (CFS) AT CONFLUENCE = 90.25	SCHOOL B 8.54 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600  SUBAREA AREA(ACRES) = 21.94 SUBAREA RUNOFF(CFS) = 17.85  EFFECTIVE AREA(ACRES) = 476.93 AREA-AVERAGED Fm(INCH/HR) = 0.51  AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.58  TOTAL AREA(ACRES) = 514.9 PEAK FLOW RATE(CFS) = 378.84  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
** CONFLUENCE DATA **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 288.59 31.83 1.419 0.87(0.49) 0.57 340.9 20510.00  1 188.23 53.68 1.037 0.86(0.49) 0.57 377.5 20500.00  2 90.25 32.22 1.409 0.97(0.58) 0.60 115.4 20530.00  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  CONFLUENCE FORMULA USED FOR 2 STREAMS.	STREET CROSS-SECTION INFORMATION:  CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 26.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00  INSIDE STREET CROSSFALL(DECIMAL) = 0.020  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 27
 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 28

```
*NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
      STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20537.00 = 13124.98 FEET.
FLOW PROCESS FROM NODE 20537.00 TO NODE 20538.00 IS CODE = 48
-----
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1394.00 DOWNSTREAM(FEET) = 1380.00
 FLOW LENGTH (FEET) = 851.83 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 6.54
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 14.49
 BOX-FLOW(CFS) = 378.84
 BOX-FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 35.44
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20538.00 = 13976.81 FEET.
*******************
 FLOW PROCESS FROM NODE 20538.00 TO NODE 20538.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 35.44
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                               SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 6.57
                                   0.75
                                          0.500
                                               56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                         9.02
                                   0.75
                                         0.600
                                               56
                           6.87
                                   0.75
                                          0.100
                                               56
 COMMERCIAL
                     В
 PUBLIC PARK
                     В
                           0.38
                                   0.75
                                         0.850
                                                56
 SCHOOL
                     В
                           0.45
                                   0.75
                                         0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.428
 SUBAREA AREA(ACRES) = 23.29
                           SUBAREA RUNOFF (CFS) = 21.17
 EFFECTIVE AREA(ACRES) = 500.22 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 538.2
                           PEAK FLOW RATE (CFS) = 378.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
FLOW PROCESS FROM NODE 20538.00 TO NODE 20539.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1366.00
 FLOW LENGTH (FEET) = 1281.91 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 7.00 GIVEN BOX HEIGHT(FEET) = 4.00
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 7.71
```

```
ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 12.29
 BOX-FLOW(CFS) = 378.84
 BOX-FLOW TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 37.18
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.
FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 37.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.293
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                             Fр
                                      Aр
                                            SCS
    LAND USE
                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.02
                                0.75
                                      0.600
                                             56
                  В
                       3.73
                              0.75 0.100
                                            56
 COMMERCIAL
 PUBLIC PARK
                  В
                         1.42
                                0.75
                                      0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.308
 SUBAREA AREA(ACRES) = 5.17
                        SUBAREA RUNOFF (CFS) = 4.94
 EFFECTIVE AREA(ACRES) = 505.39 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 543.4
                          PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
*******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
********************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20454.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3127.44 Tc (MIN.) = 49.44
 AREA-AVERAGED Fm (INCH/HR) = 0.55 Ybar = 0.56
 TOTAL AREA (ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3127.44 Tc (MIN.) = 49.44
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
 TOTAL AREA (ACRES) = 5435.8
```

File name: LR0205ZZ.RES

Page 30

Date: 04/21/2014

```
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
                                                                            TOTAL AREA (ACRES) = 5454.9 PEAK FLOW RATE (CFS) = 3127.44
                                                                            NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 12
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
 >>>>CLEAR MEMORY BANK # 2 <<<<<
                                                                           *******************
                                                                             FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 11
FLOW PROCESS FROM NODE 20454.00 TO NODE 20539.00 IS CODE = 54
                                                                            >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                           ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             ** MAIN STREAM CONFLUENCE DATA **
                                                                             PEAK FLOW RATE (CFS) = 3127.44 Tc (MIN.) = 50.28
______
 ELEVATION DATA: UPSTREAM(FEET) = 1395.00 DOWNSTREAM(FEET) = 1366.00
                                                                            AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1483.64 CHANNEL SLOPE = 0.0195
                                                                            TOTAL AREA (ACRES) = 5454.9
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 3127.44
                                                                             ** MEMORY BANK # 1 CONFLUENCE DATA **
 FLOW VELOCITY (FEET/SEC.) = 29.65 FLOW DEPTH (FEET) = 4.86
                                                                             STREAM
                                                                                       0
                                                                                           Tc Intensity Fp(Fm)
                                                                                                                                HEADWATER
                                                                                                                       Ae
 TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 50.28
                                                                             NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                         (ACRES) NODE
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
                                                                              1
                                                                                     378.84 37.18 1.293 0.88(0.50) 0.57 505.4 20510.00
                                                                                     377.04 37.58 1.284 0.88(0.50) 0.57
                                                                                                                         507.5 20530.00
******************
                                                                                3
                                                                                     239.80 59.01
                                                                                                  0.980 0.88( 0.50) 0.57
                                                                                                                          543.4 20500.00
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81
                                                                             LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
_____
                                                                            UNIT-HYDROGRAPH DATA:
 MAINLINE Tc(MIN.) = 50.28
                                                                             RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.06;3H= 1.83;6H= 2.60;24H= 5.79
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.079
                                                                             S-GRAPH: VALLEY(DEV.) = 54.6%; VALLEY(UNDEV.) / DESERT= 45.4%
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                                                            Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.55; Ybar = 0.56
                                   Fp
                                                    SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
     LAND USE
 PUBLIC PARK
                     В
                              2.13
                                      0.75
                                              0.850
                                                    56
                                                                            DEPTH-AREA FACTORS: 5M = 0.76; 30M = 0.76; 1HR = 0.76;
                              8.75
                                              0.600
                                                    56
                                                                            3HR = 0.96; 6HR = 0.98; 24HR = 0.99
 SCHOOL
                       В
                                      0.75
 RESIDENTIAL
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5998.3
 "3-4 DWELLINGS/ACRE"
                              3.67
                                      0.75
                                              0.600
                                                    56
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
                       В
 COMMERCIAL
                       В
                              0.11
                                      0.75
                                              0.100
                                                   56
                                                                             EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 RESIDENTIAL
                                                                             Lca/L=0.3,n=.0303; Lca/L=0.4,n=.0271; Lca/L=0.5,n=.0249; Lca/L=0.6,n=.0233
 "5-7 DWELLINGS/ACRE"
                              0.07
                                      0.75
                                              0.500
                                                    56
                                                                            TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1321.94
                       В
 MOBILE HOME PARK
                       В
                              4.39
                                      0.75
                                                                            PEAK FLOW RATE (CFS) = 3223.65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.544
 SUBAREA AREA(ACRES) = 19.12
                                                                             FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.81;1H= 1.06;3H= 1.85;6H= 2.63;24H= 5.89
                                                                            >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                           _____
 S-GRAPH: VALLEY(DEV.) = 50.2%; VALLEY(UNDEV.) / DESERT = 49.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                           Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.55; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 152
 DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;
 3HR = 0.96; 6HR = 0.98; 24HR = 0.99
                                                                             >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 5454.9
                                                                           ______
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
                                                                            PEAK FLOWRATE TABLE FILE NAME: 20539.DNA
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                           _____
  Lca/L=0.3,n=.0303; Lca/L=0.4,n=.0271; Lca/L=0.5,n=.0249; Lca/L=0.6,n=.0233
                                                                            END OF STUDY SUMMARY:
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 1225.48
                                                                            TOTAL AREA (ACRES) = 5998.3 TC (MIN.) =
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3001.02
                                                                            AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
       Date: 04/21/2014
                                                                                  Date: 04/21/2014
                     File name: LR020577.RFS
                                                   Page 31
                                                                                                  File name: LR020577.RFS
                                                                                                                               Page 32
```

PEAK FLOW RATE (CFS) = $3223.6$	PEAK FLOW RATE(CFS)
---------------------------------	---------------------

\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 33
 Date: 04/21/2014
 File name: LR0205ZZ.RES
 Page 34

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20658

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0206ZZ.DAT

TIME/DATE OF STUDY: 08:12 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

"OPEK-DELINED FORMITUMIC INTERLOPATION OPED FOR WINLAFF"

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL. CURR GUTTER-GEOMETRIES. MANNING

	DALL-	CROWN 10	SIKEEI-CKOSSIALL:	CUKD	GOIIEK.	-GEOMETI	KIED:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	==========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS: AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20600.00 TO NODE 20601.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 667.14 ELEVATION DATA: UPSTREAM(FEET) = 2277.00 DOWNSTREAM(FEET) = 2175.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.086 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.195 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αp SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.56 0.75 0.600 56 8.09 RESIDENTIAL "2 DWELLINGS/ACRE" B 5.26 0.75 0.700 56 8.60 NATURAL FAIR COVER 0.30 "OPEN BRUSH" R 0.61 1.000 66 13.86 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.706 SUBAREA RUNOFF (CFS) = 14.73TOTAL AREA (ACRES) = 6.12 PEAK FLOW RATE (CFS) = 14.73 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89 FLOW PROCESS FROM NODE 20601.00 TO NODE 20602.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <

ELEVATION DATA: UPSTREAM(FEET) = 2175.00 DOWNSTREAM(FEET) = 2160.00

Date: 04/21/2014

File name: LR0206ZZ.RES

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 204.73 CHANNEL SLOPE = 0.0733
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             14.73
 FLOW VELOCITY (FEET/SEC.) = 3.61 FLOW DEPTH (FEET) = 0.52
 TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 9.03
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20602.00 = 871.87 FEET.
FLOW PROCESS FROM NODE 20602.00 TO NODE 20602.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 9.03
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.990
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                             Aр
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             0.68
                                      0.75
                                             0.700
                                                   56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.18
                                      0.75
                                             0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
 SUBAREA AREA(ACRES) = 0.86
                            SUBAREA RUNOFF (CFS) = 1.93
 EFFECTIVE AREA(ACRES) = 6.98 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 7.0 PEAK FLOW RATE (CFS) =
                                                    15.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
******************
 FLOW PROCESS FROM NODE 20602.00 TO NODE 20603.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2145.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.43 CHANNEL SLOPE = 0.0559
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             15.53
 FLOW VELOCITY (FEET/SEC.) = 3.30 FLOW DEPTH (FEET) = 0.56
 TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 10.38
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20603.00 = 1140.30 FEET.
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20603.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 10.38
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.750
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                   B 1.70 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 1.70 SUBAREA RUNOFF (CFS) = 3.41
 EFFECTIVE AREA(ACRES) = 8.68 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 8.7 PEAK FLOW RATE (CFS) = 17.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20604.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2145.00 DOWNSTREAM(FEET) = 2135.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 214.72 CHANNEL SLOPE = 0.0466
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 17.43
 FLOW VELOCITY (FEET/SEC.) = 3.17 FLOW DEPTH (FEET) = 0.61
 TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 11.51
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20604.00 = 1355.02 FEET.
*******************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20604.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.51
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.585
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                         Ар
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 1.97
                                   0.75
                                          0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.08
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 2.05 SUBAREA RUNOFF(CFS) = 3.81
 EFFECTIVE AREA(ACRES) = 10.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 10.7 PEAK FLOW RATE (CFS) =
                                               19.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.69; 6HR = 2.29; 24HR = 4.89
*******************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20605.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2135.00 DOWNSTREAM(FEET) = 2125.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 174.03 CHANNEL SLOPE = 0.0575
```

Date: 04/21/2014 File name: LR020677.RFS

Page 4

Date: 04/21/2014 File name: LR0206ZZ.RES Page 3

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            19.95
 FLOW VELOCITY (FEET/SEC.) = 3.60 FLOW DEPTH (FEET) = 0.61
 TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 12.32
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20605.00 = 1529.05 FEET.
******************
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20605.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 12.32
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.482
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Ар
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 2.05
                                    0.75
                                           0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10
                                    0.75
                                         0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA AREA(ACRES) = 2.15 SUBAREA RUNOFF(CFS) = 3.80
 EFFECTIVE AREA(ACRES) = 12.88 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.9
                           PEAK FLOW RATE(CFS) =
                                                  22.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
*****
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20606.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2115.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 235.99 CHANNEL SLOPE = 0.0424
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            22.75
 FLOW VELOCITY (FEET/SEC.) = 3.32 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 13.50
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20606.00 = 1765.04 FEET.
******************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20606.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 13.50
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.349
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           αA
                                                 SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                            3.11
                                    0.75
                                           0.700 56
```

```
"3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) =
 EFFECTIVE AREA(ACRES) = 16.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.2
                              PEAK FLOW RATE(CFS) =
                                                    26.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
*******************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20607.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2115.00 DOWNSTREAM(FEET) = 2092.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 277.39 CHANNEL SLOPE = 0.0829
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             26.69
 FLOW VELOCITY (FEET/SEC.) = 4.40 FLOW DEPTH (FEET) = 0.64
 TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 14.56
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20607.00 = 2042.43 FEET.
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20607.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.56
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.246
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.41
                                     0.75
                                            0.700
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.659
 SUBAREA AREA(ACRES) = 0.70
                             SUBAREA RUNOFF(CFS) = 1.10
 EFFECTIVE AREA(ACRES) = 16.91 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.9
                              PEAK FLOW RATE(CFS) =
                                                    26.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20608.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
```

Page 6

RESIDENTIAL

Date: 04/21/2014 File name: LR0206ZZ.RES Page 5

```
ELEVATION DATA: UPSTREAM(FEET) = 2092.00 DOWNSTREAM(FEET) = 2080.00
                                                                                                  В 5.77
                                                                                                                 0.75
                                                                                                                        0.100
                                                                            COMMERCIAL
                                                                                                                                56
 CHANNEL LENGTH THRU SUBAREA (FEET) = 203.75 CHANNEL SLOPE = 0.0589
                                                                            RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  B 7.52
                                                                                                                 0.75
                                                                                                                        0.700
                                                                                                                                56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                            RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.91
                                                                                                                 0.75
                                                                                                                        0.600
                               26.69
                                                                                                  В
                                                                                                         1.23
 FLOW VELOCITY (FEET/SEC.) = 3.89 FLOW DEPTH (FEET) = 0.68
                                                                            MOBILE HOME PARK
                                                                                                                 0.75
                                                                                                                        0.250
 TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 15.43
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE" B 0.92
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20608.00 = 2246.18 FEET.
                                                                                                                 0.75 0.900
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
************************
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.460
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20608.00 IS CODE = 81
                                                                            SUBAREA AREA (ACRES) = 16.35 SUBAREA RUNOFF (CFS) = 24.95
                                                                            EFFECTIVE AREA(ACRES) = 38.51 AREA-AVERAGED Fm(INCH/HR) = 0.44
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
_____
                                                                            TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) =
                                                                                                                                55.43
 MAINLINE Tc(MIN.) = 15.43
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.169
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Аp
                                   Fр
                                                    SCS
                                                                           ******************
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                            FLOW PROCESS FROM NODE 20609.00 TO NODE 20610.00 IS CODE = 63
 "2 DWELLINGS/ACRE"
                    В
                            2.94
                                      0.75
                                             0.700 56
 RESIDENTIAL
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 "3-4 DWELLINGS/ACRE" B
                            2.31 0.75
                                            0.600 56
                                                                           >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.656
                                                                            UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
 SUBAREA AREA (ACRES) = 5.25 SUBAREA RUNOFF (CFS) = 7.93
                                                                            STREET LENGTH (FEET) = 360.92 CURB HEIGHT (INCHES) = 6.0
 EFFECTIVE AREA(ACRES) = 22.16 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                            STREET HALFWIDTH (FEET) = 18.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 22.2 PEAK FLOW RATE(CFS) = 33.05
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
*****************
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20609.00 IS CODE = 54
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
______
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2065.00
                                                                              ***STREET FLOWING FULL***
 CHANNEL LENGTH THRU SUBAREA (FEET) = 358.70 CHANNEL SLOPE = 0.0418
                                                                             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                             STREET FLOW DEPTH (FEET) = 0.64
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                             HALFSTREET FLOOD WIDTH (FEET) = 25.21
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              33.05
                                                                             AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.44
 FLOW VELOCITY (FEET/SEC.) = 3.61 FLOW DEPTH (FEET) = 0.78
                                                                             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86
 TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 17.08
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 18.44
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20609.00 = 2604.88 FEET.
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.949
                                                                            SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fp
                                                                                                                         Αр
 FLOW PROCESS FROM NODE 20609.00 TO NODE 20609.00 IS CODE = 81
                                                                                LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            RESIDENTIAL
                                                                            "5-7 DWELLINGS/ACRE"
                                                                                                В 1.29
                                                                                                                 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                                                        0.500
                                                                                                                                56
______
                                                                            COMMERCIAL
                                                                                                в 2.79
                                                                                                                 0.75
                                                                                                                        0.100
                                                                                                                                56
 MAINLINE Tc (MIN.) = 17.08
                                                                            RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.040
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                               В
                                                                                                         0.24
                                                                                                                 0.75
                                                                                                                        0.600
                                                                                                                                56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                          Ар
                                                    SCS
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.95
                                                                                                                 0.75
                                                                                                                        0.700
                                                                                                                                56
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            MOBILE HOME PARK
                                                                                                  В
                                                                                                         0.22
                                                                                                                 0.75
                                                                                                                        0.250
       Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                  Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                                                               Page 8
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 SUBAREA AREA(ACRES) = 5.49 SUBAREA RUNOFF(CFS) = 8.42
 EFFECTIVE AREA(ACRES) = 44.00 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 44.0 PEAK FLOW RATE (CFS) =
                                                           60.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.40
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 2.88
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20610.00 = 2965.80 FEET.
*****************
 FLOW PROCESS FROM NODE 20610.00 TO NODE 20611.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2057.00
 STREET LENGTH (FEET) = 352.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.79
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86
 STREET FLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 19.95
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.859
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     в 0.30
                                                  0.500
                                                        56
                                          0.75
                                1.71
 COMMERCIAL
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                                1.66
                                          0.75
                                                  0.400
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                               1.04
                                          0.75
                                                  0.600
                                                        56
 RESIDENTIAL
                       В
                               12.96
                                          0.75
                                                  0.700
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
```

```
EFFECTIVE AREA (ACRES) = 61.67 AREA-AVERAGED Fm (INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.57
 TOTAL AREA(ACRES) = 61.7
                                 PEAK FLOW RATE(CFS) =
                                                           79.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.95
 FLOW VELOCITY (FEET/SEC.) = 4.00 DEPTH*VELOCITY (FT*FT/SEC.) = 3.03
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 352.2 FT WITH ELEVATION-DROP = 3.0 FT, IS 43.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20611.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20611.00 = 3318.05 FEET.
*******************
 FLOW PROCESS FROM NODE 20611.00 TO NODE 20612.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2057.00 DOWNSTREAM ELEVATION(FEET) = 2054.00
 STREET LENGTH (FEET) = 398.28 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    106.54
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.85
   HALFSTREET FLOOD WIDTH (FEET) = 35.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.48
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 21.57
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.773
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                          SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       B 0.48
                                          0.75
                                                  0.500
                                                          56
 COMMERCIAL
                         B 2.00
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                         в 37.07
                                          0.75
                                                  0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                                 6.98
                                          0.75
                                                  0.600
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                         B
                                 0.01
                                          0.75
                                                  0.400
                                                          56
 NATURAL FAIR COVER
       Date: 04/21/2014
                         File name: LR0206ZZ.RES
                                                        Page 10
```

SUBAREA AREA (ACRES) = 17.67 SUBAREA RUNOFF (CFS) = 22.37

Date: 04/21/2014 File name: LR0206ZZ.RES Page 9

```
"OPEN BRUSH"
                       В
                               0.36 0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.660
 SUBAREA AREA(ACRES) = 46.90 SUBAREA RUNOFF(CFS) = 54.07
 EFFECTIVE AREA(ACRES) = 108.57 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 108.6 PEAK FLOW RATE (CFS) = 128.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.91 HALFSTREET FLOOD WIDTH(FEET) = 38.40
 FLOW VELOCITY (FEET/SEC.) = 4.26 DEPTH*VELOCITY (FT*FT/SEC.) = 3.87
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 5.76
 PIPE-FLOW(CFS) = 18.10
 PIPEFLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 21.10
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.797
 SUBAREA AREA (ACRES) = 46.90 SUBAREA RUNOFF (CFS) = 55.07
 TOTAL AREA (ACRES) = 108.6 PEAK FLOW RATE (CFS) = 131.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 113.05
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.60
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20612.00 = 3716.33 FEET.
*****************
 FLOW PROCESS FROM NODE 20612.00 TO NODE 20613.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2054.00 DOWNSTREAM ELEVATION(FEET) = 2050.00
 STREET LENGTH (FEET) = 366.37 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

File name: LR0206ZZ.RES

Page 11

Date: 04/21/2014

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    133.98
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.86
 HALFSTREET FLOOD WIDTH (FEET) = 36.20
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.97
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.30
STREET FLOW TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 22.33
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.737
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                         Fρ
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B 0.53
                                         0.75
                                                  0.500
                                                          56
                      в 2.00
COMMERCIAL
                                         0.75
                                                  0.100
                                                          56
RESIDENTIAL
"2 DWELLINGS/ACRE"
                      В 1.58
                                          0.75
                                                  0.700
                                                          56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.26
                                         0.75 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
SUBAREA AREA (ACRES) = 4.37 SUBAREA RUNOFF (CFS) = 5.67
EFFECTIVE AREA(ACRES) = 112.94 AREA-AVERAGED Fm(INCH/HR) = 0.45
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
TOTAL AREA(ACRES) = 112.9
                                 PEAK FLOW RATE (CFS) = 131.15
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 35.90
FLOW VELOCITY (FEET/SEC.) = 4.95 DEPTH*VELOCITY (FT*FT/SEC.) = 4.25
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.93
PIPE-FLOW(CFS) =
                  21.79
PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 21.98
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.753
SUBAREA AREA (ACRES) = 4.37 SUBAREA RUNOFF (CFS) = 5.73
TOTAL AREA(ACRES) = 112.9
                                PEAK FLOW RATE (CFS) = 132.62
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 110.83
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.81
 HALFSTREET FLOOD WIDTH (FEET) = 33.58
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.76
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.86
LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20613.00 = 4082.70 FEET.
```

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90

Date: 04/21/2014 File name: LR0206ZZ.RES Page 12

FLOW PROCESS FROM NODE 20613.00 TO NODE 20614.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2050.00 DOWNSTREAM ELEVATION(FEET) = 2047.00 STREET LENGTH (FEET) = 389.73 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 136.13 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.92HALFSTREET FLOOD WIDTH (FEET) = 39.07 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.35 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.01 STREET FLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 23.48

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.686 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA

SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" 0.63 0.500 56 0.75 COMMERCIAL в 2.36 0.75 0.100 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" 0.24 0.75 0.600 RESIDENTIAL "2 DWELLINGS/ACRE" В 2.47 0.75 0.700 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425 SUBAREA AREA (ACRES) = 5.70 SUBAREA RUNOFF (CFS) = 7.02 EFFECTIVE AREA(ACRES) = 118.64 AREA-AVERAGED Fm(INCH/HR) = 0.44 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59TOTAL AREA (ACRES) = 118.6 PEAK FLOW RATE (CFS) = 132.75

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89

END OF SUBAREA STREET FLOW HYDRAULICS:

DEPTH(FEET) = 0.91 HALFSTREET FLOOD WIDTH(FEET) = 38.64 FLOW VELOCITY (FEET/SEC.) = 4.34 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.96

\*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE

PIPE-FLOW VELOCITY(FEET/SEC.) = 6.29PIPE-FLOW(CFS) = 25.05 PIPEFLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 23.02 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.706 SUBAREA AREA (ACRES) = 5.70 SUBAREA RUNOFF (CFS) = 7.12 TOTAL AREA(ACRES) = 118.6 PEAK FLOW RATE (CFS) = 134.90 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89 STREETFLOW HYDRAULICS BASED ON MAINLINE To : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 109.85 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.86HALFSTREET FLOOD WIDTH (FEET) = 35.90 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.15PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.56 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20614.00 = 4472.43 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20614.00 TO NODE 20615.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2047.00 DOWNSTREAM ELEVATION(FEET) = 2044.00 STREET LENGTH (FEET) = 321.66 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.15 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.90HALFSTREET FLOOD WIDTH (FEET) = 37.85 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.22 STREET FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 24.16 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.657 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" В 0.61 0.75 0.500 56 В COMMERCIAL 1.87 0.75 0.100 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.40 0.75 0.600 56 RESIDENTIAL "2 DWELLINGS/ACRE" B 2.63 0.75 0.700

File name: LR0206ZZ.RES

Page 14

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.467
 SUBAREA AREA(ACRES) = 5.51 SUBAREA RUNOFF(CFS) = 6.49
 EFFECTIVE AREA(ACRES) = 124.15 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA(ACRES) = 124.1 PEAK FLOW RATE(CFS) = 136.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 37.60
 FLOW VELOCITY (FEET/SEC.) = 4.69 DEPTH*VELOCITY (FT*FT/SEC.) = 4.19
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 6.93
 PIPE-FLOW(CFS) = 27.57
 PIPEFLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 23.79
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.672
 SUBAREA AREA (ACRES) = 5.51 SUBAREA RUNOFF (CFS) = 6.56
 TOTAL AREA (ACRES) = 124.1 PEAK FLOW RATE (CFS) = 137.89
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 110.31
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.83
   HALFSTREET FLOOD WIDTH (FEET) = 34.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.72
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20615.00 = 4794.09 FEET.
*****************
 FLOW PROCESS FROM NODE 20615.00 TO NODE 20616.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2044.00 DOWNSTREAM ELEVATION(FEET) = 2042.00
 STREET LENGTH (FEET) = 320.06 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 144.37
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

File name: LR0206ZZ.RES

Page 15

Date: 04/21/2014

```
STREET FLOW DEPTH(FEET) = 0.97
   HALFSTREET FLOOD WIDTH (FEET) = 41.69
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.07
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.96
 STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 25.10
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.619
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                          Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 2.51 0.75 COMMERCIAL B 0.24 0.75
                                                   0.500
                                                           56
                                                   0.100
                                                           56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.23
                                           0.75
                                                   0.600
                                                           56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 7.57 0.75 0.700
                                                           56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.631
 SUBAREA AREA(ACRES) = 12.55 SUBAREA RUNOFF(CFS) = 12.96
 EFFECTIVE AREA(ACRES) = 136.70 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 136.7 PEAK FLOW RATE (CFS) = 144.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.98 HALFSTREET FLOOD WIDTH(FEET) = 41.75
 FLOW VELOCITY (FEET/SEC.) = 4.07 DEPTH*VELOCITY (FT*FT/SEC.) = 3.97
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 6.48
 PIPE-FLOW(CFS) = 38.54
 PIPEFLOW TRAVEL TIME (MIN.) = 0.82 Tc(MIN.) = 24.61
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.639
 SUBAREA AREA(ACRES) = 12.55 SUBAREA RUNOFF(CFS) = 13.18
 TOTAL AREA(ACRES) = 136.7 PEAK FLOW RATE(CFS) = 147.29
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 108.75
  ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.88
   HALFSTREET FLOOD WIDTH (FEET) = 37.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.82
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.38
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20616.00 = 5114.15 FEET.
******************
 FLOW PROCESS FROM NODE 20616.00 TO NODE 20648.00 IS CODE = 63
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 16

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 101.34
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.67
  HALFSTREET FLOOD WIDTH (FEET) = 26.25
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.98
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.64
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5637.07 FEET.
*******************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
FLOW PROCESS FROM NODE 20620.00 TO NODE 20621.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 866.66
 ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2160.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.083
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.511
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                 SCS Tc
                                          αA
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 11.35 0.61 1.000
                                                 66 20.71
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89 0.75 0.600
                                                 56 12.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.971
 SUBAREA RUNOFF(CFS) = 21.03
 TOTAL AREA (ACRES) = 12.24 PEAK FLOW RATE (CFS) = 21.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
******************
 FLOW PROCESS FROM NODE 20621.00 TO NODE 20622.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 356.13 CHANNEL SLOPE = 0.0281
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            21.03
 FLOW VELOCITY (FEET/SEC.) = 2.26 FLOW DEPTH (FEET) = 0.52
```

PEAK FLOW RATE (CFS) = 152.81

TOTAL AREA (ACRES) = 144.5

Date: 04/21/2014 File name: LR0206ZZ.RES Page 18

```
TRAVEL TIME (MIN.) = 2.63 Tc (MIN.) = 14.71
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20622.00 = 1222.79 FEET.
********************
 FLOW PROCESS FROM NODE 20622.00 TO NODE 20622.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.71
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.231
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                            3.73
                                    0.61
                                           1.000
                                                 66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 1.57
                                    0.75
                                           0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                           1.62
                                    0.75
                                           0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.838
 SUBAREA AREA(ACRES) = 6.92
                            SUBAREA RUNOFF (CFS) = 10.44
 EFFECTIVE AREA(ACRES) = 19.16 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.92
 TOTAL AREA (ACRES) = 19.2
                             PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
*****************
 FLOW PROCESS FROM NODE 20622.00 TO NODE 20623.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2145.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 158.50 CHANNEL SLOPE = 0.0315
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              28.39
 FLOW VELOCITY (FEET/SEC.) = 2.52 FLOW DEPTH (FEET) = 0.57
 TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 15.76
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20623.00 = 1381.29 FEET.
******************
 FLOW PROCESS FROM NODE 20623.00 TO NODE 20623.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.76
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.141
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                            3.20
                                    0.75
                                           0.700
                                                 56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            0.56
                                    0.61
                                           1.000
                                                 66
```

"8-10 DWELLINGS/ACRE"	В	1.58	0.75	0.400	56	
RESIDENTIAL	2	1.00	0.75	0.100	50	
"3-4 DWELLINGS/ACRE" RESIDENTIAL	В	2.74	0.75	0.600	56	
".4 DWELLING/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU	S LOSS RAT	E, Fp(INC	CH/HR) = 0		56	
SUBAREA AVERAGE FERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) =	8.16 27.32 R) = 0.66	SUBAREA AREA-A AREA-A	A RUNOFF(CF: AVERAGED Fm /ERAGED Ap :	(INCH/HR) = 0.84	= 0.55	
SUBAREA AREA-AVERAGED R 5M = 0.36; 30M = 0.73;				2.29; 24H	R = 4.89	9
**************************************	20623.00	TO NODE	20624.00 I	S CODE =	54	
>>>>COMPUTE TRAPEZOIDA >>>>TRAVELTIME THRU SU	BAREA (EXI	STING ELE	EMENT) <<<<			
ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUB CHANNEL BASE (FEET) = MANNING'S FACTOR = 0.04 CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC. TRAVEL TIME (MIN.) = 1 LONGEST FLOWPATH FROM N  ***********************************	AREA (FEET) 0.00 "Z 5 MAXIMU EA (CFS) = ) = 2.30 .82 Tc (M ODE 20620	= 251. " FACTOR M DEPTH(H 39.1 FLOW I IN.) = .00 TO NO	47 CHANNI = 35.000 FEET) = 1 16 DEPTH (FEET) 17.58 DDE 20624.	EL SLOPE = .00 = 0.70 00 = 16	0.0199 32.76 FF	9 EET.
>>>>ADDITION OF SUBARE						
MAINLINE TC(MIN.) = 1 * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/	7.58 ENSITY(INC AMC II): SCS SOIL	======================================	2.005	Ap	SCS	====
"8-10 DWELLINGS/ACRE" RESIDENTIAL	В	4.38	0.75	0.400	56	
"3-4 DWELLINGS/ACRE" RESIDENTIAL	В	5.30	0.75	0.600	56	
".4 DWELLING/ACRE"  CONDOMINIUMS SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA(ACRES) =	B S LOSS RAT S AREA FRA 10.90 38.22 R) = 0.68	0.14 E, Fp(INC CTION, Ap SUBAREA AREA-A	0.75 CH/HR) = 0 D = 0.546 A RUNOFF(CF) AVERAGED FM VERAGED Ap	0.350 .75 S) = 15. (INCH/HR) = 0.75	56 66 = 0.51	
SUBAREA AREA-AVERAGED R 5M = 0.36; 30M = 0.73;				2.29; 24H	R = 4.89	9

RESIDENTIAL

Date: 04/21/2014 File name: LR0206ZZ.RES Page 19

File name: LR0206ZZ.RES

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 20624.00 TO NODE 20625.00 IS CODE = 54
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                ***STREET FLOWING FULL***
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                               STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
                                                                               STREET FLOW DEPTH (FEET) = 0.55
_____
                                                                               HALFSTREET FLOOD WIDTH (FEET) = 20.39
 ELEVATION DATA: UPSTREAM(FEET) = 2140.00 DOWNSTREAM(FEET) = 2130.00
                                                                               AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.39
 CHANNEL LENGTH THRU SUBAREA (FEET) = 332.21 CHANNEL SLOPE = 0.0301
                                                                               PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.50
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 20.40
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                              * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.834
 CHANNEL FLOW THRU SUBAREA (CFS) = 51.48
                                                                              SUBAREA LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
 FLOW VELOCITY (FEET/SEC.) = 2.88 FLOW DEPTH (FEET) = 0.71
                                                                                  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TRAVEL TIME (MIN.) = 1.92 Tc (MIN.) = 19.50
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20625.00 = 1964.97 FEET.
                                                                              RESIDENTIAL
                                                                              "8-10 DWELLINGS/ACRE" B 0.09
                                                                                                                    0.75
                                                                                                                           0.400
*******************
                                                                              RESIDENTIAL
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20625.00 IS CODE = 81
                                                                              "3-4 DWELLINGS/ACRE" B 4.68
                                                                                                                    0.75
                                                                                                                           0.600
                                                                              MOBILE HOME PARK
                                                                                                    В
                                                                                                           0.24
                                                                                                                    0.75
                                                                                                                           0.250
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                              RESIDENTIAL
_____
                                                                              ".4 DWELLING/ACRE"
                                                                                                  B 0.04
                                                                                                                    0.75 0.900
 MAINLINE Tc(MIN.) = 19.50
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.884
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582
                                                                              SUBAREA AREA(ACRES) = 5.05 SUBAREA RUNOFF(CFS) = 6.36
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              EFFECTIVE AREA(ACRES) = 48.90 AREA-AVERAGED Fm(INCH/HR) = 0.49
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                             qД
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.72
                                                                              TOTAL AREA (ACRES) = 48.9 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.47
                                       0.75
                                              0.600 56
 RESIDENTIAL
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "8-10 DWELLINGS/ACRE" B 0.16
                                    0.75 0.400 56
                                                                              5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA(ACRES) = 5.63
                              SUBAREA RUNOFF (CFS) = 7.29
                                                                              DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.51
 EFFECTIVE AREA(ACRES) = 43.85 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                              FLOW VELOCITY (FEET/SEC.) = 6.45 DEPTH*VELOCITY (FT*FT/SEC.) = 3.55
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
                                                                              LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20626.00 = 2307.32 FEET.
 TOTAL AREA (ACRES) = 43.9 PEAK FLOW RATE (CFS) =
                                                      54.61
                                                                            ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              FLOW PROCESS FROM NODE 20626.00 TO NODE 20627.00 IS CODE = 63
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*********************
                                                                              >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                            _____
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20626.00 IS CODE = 63
                                                                              UPSTREAM ELEVATION(FEET) = 2116.00 DOWNSTREAM ELEVATION(FEET) = 2110.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              STREET LENGTH (FEET) = 424.67 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              STREET HALFWIDTH (FEET) = 18.00
______
 UPSTREAM ELEVATION(FEET) = 2130.00 DOWNSTREAM ELEVATION(FEET) = 2116.00
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 342.35 CURB HEIGHT (INCHES) = 6.0
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                              61.35
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74
                                                                               STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Date: 04/21/2014 File name: LR020677.RFS Page 21 File name: LR020677.RFS

Date: 04/21/2014

SCS

56

56

59.00

```
STREET FLOW DEPTH (FEET) = 0.65
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.28
   HALFSTREET FLOOD WIDTH (FEET) = 25.40
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.83 Tc (MIN.) = 24.80
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.50
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.631
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.92
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.57 Tc (MIN.) = 21.97
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.754
                                                                                      LAND USE
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
                                                                                  "8-10 DWELLINGS/ACRE" B 1.07
                                                                                                                           0.75
                                                                                                                                          56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Αp
                                                                                                                                  0.400
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  RESIDENTIAL
                                                                                  ".4 DWELLING/ACRE"
                                                                                                       B 2.66
                                                                                                                          0.75
                                                                                                                                  0.900
                                                                                                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.03
                                         0.75
                                                 0.400
                                                       56
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       B 1.65 0.75 0.600
 RESIDENTIAL
                                                                                                                                          56
 "3-4 DWELLINGS/ACRE" B 2.50
                                         0.75
                                                 0.600
                                                                                  COMMERCIAL
                                                                                                        B 0.68
                                                                                                                          0.75 0.100 56
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 1.53
                                         0.75
                                                 0.900 56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.640
 MOBILE HOME PARK
                       В
                                0.07
                                         0.75
                                                 0.250 56
                                                                                  SUBAREA AREA (ACRES) = 6.06 SUBAREA RUNOFF (CFS) = 6.28
 COMMERCIAL
                        В
                                0.09
                                         0.75
                                                 0.100 56
                                                                                  EFFECTIVE AREA(ACRES) = 59.18 AREA-AVERAGED Fm(INCH/HR) = 0.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
                                                                                  TOTAL AREA (ACRES) = 59.2 PEAK FLOW RATE (CFS) = 60.58
 SUBAREA AREA(ACRES) = 4.22
                               SUBAREA RUNOFF (CFS) = 4.70
 EFFECTIVE AREA(ACRES) = 53.12 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.72
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 TOTAL AREA (ACRES) = 53.1 PEAK FLOW RATE (CFS) =
                                                          60.18
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 32.11
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                  FLOW VELOCITY (FEET/SEC.) = 2.84 DEPTH*VELOCITY (FT*FT/SEC.) = 2.22
                                                                                  LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20628.00 = 3218.91 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 *******************
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.21
 FLOW VELOCITY (FEET/SEC.) = 4.47 DEPTH*VELOCITY (FT*FT/SEC.) = 2.88
                                                                                  FLOW PROCESS FROM NODE 20628.00 TO NODE 20629.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20627.00 = 2731.99 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20627.00 TO NODE 20628.00 IS CODE = 63
                                                                                 ______
                                                                                  UPSTREAM ELEVATION(FEET) = 2108.00 DOWNSTREAM ELEVATION(FEET) = 2103.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 256.63 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 2110.00 DOWNSTREAM ELEVATION(FEET) = 2108.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 486.92 CURB HEIGHT (INCHES) = 6.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                                                                     63.35
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.62
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 24.18
   ***STREET FLOWING FULL***
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.18
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 25.64
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.66
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.599
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.87
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 23 Date: 04/21/2014 File name: LR0206ZZ.RES

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	"8-10 DWELLINGS/ACRE" B 0.90 0.75 0.400 56
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	RESIDENTIAL
RESIDENTIAL	".4 DWELLING/ACRE" B 1.30 0.75 0.900 56
"8-10 DWELLINGS/ACRE" B 0.98 0.75 0.400 56	RESIDENTIAL
RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 1.80 0.75 0.600 56
".4 DWELLING/ACRE" B 0.92 0.75 0.900 56	COMMERCIAL B 1.62 0.75 0.100 56
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
"3-4 DWELLINGS/ACRE" B 3.13 0.75 0.600 56 COMMERCIAL B 0.27 0.75 0.100 56	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.446
	SUBAREA AREA (ACRES) = 8.38 SUBAREA RUNOFF (CFS) = 9.31
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	EFFECTIVE AREA (ACRES) = 72.86 AREA-AVERAGED Fm(INCH/HR) = 0.47
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590	AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.67
SUBAREA AREA (ACRES) = 5.30 SUBAREA RUNOFF (CFS) = 5.52	TOTAL AREA(ACRES) = 72.9 PEAK FLOW RATE(CFS) = 71.89
EFFECTIVE AREA(ACRES) = 64.48 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.70	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
TOTAL AREA (ACRES) = 64.5 PEAK FLOW RATE (CFS) = 64.39	50darba arba-avbraged rainfall defin(inch): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
TOTAL AREA (ACRES) - 04.3 FEAR FLOW RATE (CFS) - 04.39	JM - 0.30, JUM - 0.73, INK - 0.90, JNK - 1.04, ONK - 2.29, Z4NK - 4.09
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	END OF SUBAREA STREET FLOW HYDRAULICS:
50BARBA ARBA-AVBRAGED RAINFABL DEFIN(INCH). 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89	DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.91
3H - 0.30, 30H - 0.73, 1HK - 0.30, 3HK - 1.01, 0HK - 2.23, 24HK - 4.03	FLOW VELOCITY(FEET/SEC.) = 5.47 DEPTH*VELOCITY(FT*FT/SEC.) = 3.49
END OF SUBAREA STREET FLOW HYDRAULICS:	LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20630.00 = 3753.80 FEET.
DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 24.30	BONGEST FEOMERIT FROM NODE 20020.00 TO NODE 20030.00 - 3733.00 FEET.
FLOW VELOCITY (FEET/SEC.) = 5.13 DEPTH*VELOCITY (FT*FT/SEC.) = 3.21	*******************
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20629.00 = 3475.54 FEET.	FLOW PROCESS FROM NODE 20630.00 TO NODE 20631.00 IS CODE = 63
donodor radminin rhom hobb 20020.00 to hobb 20020.00 31/0.01 radii.	
******************	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
FLOW PROCESS FROM NODE 20629.00 TO NODE 20630.00 IS CODE = 63	>>>> (STREET TABLE SECTION # 5 USED) <<<<
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA	UPSTREAM ELEVATION(FEET) = 2097.00 DOWNSTREAM ELEVATION(FEET) = 2088.00
>>>> (STREET TABLE SECTION # 5 USED) <<<<	STREET LENGTH(FEET) = 362.66 CURB HEIGHT(INCHES) = 6.0
	STREET HALFWIDTH(FEET) = 18.00
UPSTREAM ELEVATION(FEET) = 2103.00 DOWNSTREAM ELEVATION(FEET) = 2097.00	
STREET LENGTH(FEET) = 278.26 CURB HEIGHT(INCHES) = 6.0	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00
STREET HALFWIDTH (FEET) = 18.00	INSIDE STREET CROSSFALL(DECIMAL) = 0.020
	OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00	
INSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
	Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	MAVIMUM ALLOWADID OMDDDM DLOW DDDMU(DDDM) 0 05
· · · · · · · · · · · · · · · · · · ·	MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.85
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94 ***STREET FLOWING FULL***
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 TC(MIN.) = 26.49	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 TC(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568  SUBAREA LOSS RATE DATA(AMC II):	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "8-10 DWELLINGS/ACRE" B 1.22 0.75 0.400 56
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "8-10 DWELLINGS/ACRE" B 1.22 0.75 0.400 56  CONDOMINIUMS B 3.44 0.75 0.350 56
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  CONDOMINIUMS B 2.76 0.75 0.350 56	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "8-10 DWELLINGS/ACRE" B 1.22 0.75 0.400 56  CONDOMINIUMS B 3.44 0.75 0.350 56  RESIDENTIAL
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.04  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.63  HALFSTREET FLOOD WIDTH(FEET) = 24.48  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42  STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 26.49  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.568  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.94  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.64  HALFSTREET FLOOD WIDTH(FEET) = 24.85  AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.88  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75  STREET FLOW TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 27.52  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "8-10 DWELLINGS/ACRE" B 1.22 0.75 0.400 56  CONDOMINIUMS B 3.44 0.75 0.350 56

Date: 04/21/2014

File name: LR0206ZZ.RES

Page 26

Date: 04/21/2014

File name: LR0206ZZ.RES

```
RESTDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE"
                     В 2.91
                                         0.75 0.600
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448
                      B 1.38 0.75 0.100 56
 COMMERCIAL
                                                                                  SUBAREA AREA(ACRES) = 6.91 SUBAREA RUNOFF(CFS) = 7.30
                                                                                  EFFECTIVE AREA(ACRES) = 88.94 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.63
 SUBAREA AREA(ACRES) = 9.17 SUBAREA RUNOFF(CFS) = 10.11
                                                                                  TOTAL AREA (ACRES) = 88.9 PEAK FLOW RATE (CFS) =
                                                                                                                                           85.27
 EFFECTIVE AREA(ACRES) = 82.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.64
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 82.0 PEAK FLOW RATE (CFS) = 79.68
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.03
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.43 DEPTH*VELOCITY (FT*FT/SEC.) = 4.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20632.00 = 4388.35 FEET.
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.21
                                                                                 ******************
 FLOW VELOCITY (FEET/SEC.) = 5.92 DEPTH*VELOCITY (FT*FT/SEC.) = 3.82
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20631.00 = 4116.46 FEET.
                                                                                  FLOW PROCESS FROM NODE 20632.00 TO NODE 20633.00 IS CODE = 63
*****************
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20631.00 TO NODE 20632.00 IS CODE = 63
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 _____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  UPSTREAM ELEVATION(FEET) = 2080.00 DOWNSTREAM ELEVATION(FEET) = 2074.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET LENGTH (FEET) = 252.32 CURB HEIGHT (INCHES) = 6.0
______
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 2088.00 DOWNSTREAM ELEVATION(FEET) = 2080.00
 STREET LENGTH (FEET) = 271.89 CURB HEIGHT (INCHES) = 6.0
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    STREET FLOW DEPTH (FEET) = 0.69
   ***STREET FLOWING FULL***
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 27.47
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.16
   STREET FLOW DEPTH (FEET) = 0.64
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.25
   HALFSTREET FLOOD WIDTH (FEET) = 24.79
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 28.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.40
                                                                                  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.488
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.07
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 0.71 Tc (MIN.) = 28.23
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                          SCS
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.509
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  "8-10 DWELLINGS/ACRE" B 4.07
                                                                                                                          0.75
                                                                                                                                  0.400
                                                                                                                                          56
                                      Fp
                                                  qΑ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  RESIDENTIAL
 RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 3.86
                                                                                                                          0.75
                                                                                                                                  0.600
                                                                                                                                          56
 "8-10 DWELLINGS/ACRE"
                     В
                                0.65
                                         0.75
                                                 0.400 56
                                                                                  RESIDENTIAL
 CONDOMINIUMS
                      В
                              1.64
                                         0.75
                                                 0.350 56
                                                                                  ".4 DWELLING/ACRE"
                                                                                                       в 20.53
                                                                                                                          0.75
                                                                                                                                  0.900
                                                                                                                                          56
                                                                                  COMMERCIAL
                                                                                                          В
                                                                                                               1.08
                                                                                                                          0.75
                                                                                                                                  0.100
                                                                                                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                                3.35
                                         0.75
                                                 0.600 56
                                                                                  MOBILE HOME PARK
                                                                                                                 0.18
                                                                                                                          0.75
                                                                                                                                  0.250
                                1.11
                                         0.75
                                                 0.100
                                                       56
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 COMMERCIAL
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760
 ".4 DWELLING/ACRE"
                                0.16
                                         0.75
                                                 0.900 56
                                                                                  SUBAREA AREA(ACRES) = 29.72
                                                                                                                SUBAREA RUNOFF(CFS) = 24.60
```

Date: 04/21/2014

File name: LR0206ZZ.RES

Date: 04/21/2014 File name: LR0206ZZ.RES Page 27

```
EFFECTIVE AREA(ACRES) = 118.66 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 118.7 PEAK FLOW RATE (CFS) = 108.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.57
 FLOW VELOCITY (FEET/SEC.) = 6.34 DEPTH*VELOCITY (FT*FT/SEC.) = 4.51
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 252.3 FT WITH ELEVATION-DROP = 6.0 FT, IS 88.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20633.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20633.00 = 4640.67 FEET.
*****************
 FLOW PROCESS FROM NODE 20633.00 TO NODE 20644.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2074.00 DOWNSTREAM ELEVATION(FEET) = 2068.00
 STREET LENGTH (FEET) = 104.43 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 108.52
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.45
 STREET FLOW TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 29.11
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.482
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.22
                                         0.75
                                                 0.400 56
                       в 0.35
 COMMERCIAL
                                         0.75
                                                 0.100 56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.11 0.75
                                                0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 SUBAREA AREA(ACRES) = 0.68 SUBAREA RUNOFF(CFS) = 0.76
 EFFECTIVE AREA (ACRES) = 119.34 AREA-AVERAGED Fm (INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 119.3 PEAK FLOW RATE (CFS) = 108.25
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.12
 FLOW VELOCITY (FEET/SEC.) = 8.76 DEPTH*VELOCITY (FT*FT/SEC.) = 5.45
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET.
************************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 29.11
 RAINFALL INTENSITY (INCH/HR) = 1.48
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 119.34
 TOTAL STREAM AREA(ACRES) = 119.34
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 108.25
***********************
 FLOW PROCESS FROM NODE 20640.00 TO NODE 20641.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1072.64
 ELEVATION DATA: UPSTREAM(FEET) = 2182.00 DOWNSTREAM(FEET) = 2120.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.781
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.689
 SUBAREA TC AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 7.20 0.75 0.400
                                                    56 10.78
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 2.52 0.61 1.000
                                                    66 20.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556
 SUBAREA RUNOFF (CFS) = 20.19
 TOTAL AREA(ACRES) = 9.72 PEAK FLOW RATE(CFS) =
                                               20.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
*****************
 FLOW PROCESS FROM NODE 20641.00 TO NODE 20642.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 30

```
UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2119.00
 STREET LENGTH (FEET) = 375.42 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.84
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.13
 STREET FLOW TRAVEL TIME (MIN.) = 3.39 Tc (MIN.) = 14.17
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.282
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       B
                               1.12
                                          0.61
                                                 1.000 66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78
                                       0.75
                                                0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.754
 SUBAREA AREA (ACRES) = 1.90 SUBAREA RUNOFF (CFS) = 3.07
 EFFECTIVE AREA(ACRES) = 11.62 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) = 20.19
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.83
 FLOW VELOCITY (FEET/SEC.) = 1.81 DEPTH*VELOCITY (FT*FT/SEC.) = 1.08
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20642.00 = 1448.06 FEET.
******************
 FLOW PROCESS FROM NODE 20642.00 TO NODE 20643.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2119.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
 STREET LENGTH (FEET) = 635.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 23.37
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
  HALFSTREET FLOOD WIDTH (FEET) = 16.16
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.28
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92
 STREET FLOW TRAVEL TIME (MIN.) = 2.47 Tc (MIN.) = 16.65
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.072
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 3.99 0.75 0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA(ACRES) = 3.99 SUBAREA RUNOFF(CFS) = 6.37
 EFFECTIVE AREA(ACRES) = 15.61 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 15.6 PEAK FLOW RATE (CFS) =
                                                        23.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.32
 FLOW VELOCITY (FEET/SEC.) = 4.29 DEPTH*VELOCITY (FT*FT/SEC.) = 1.94
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20643.00 = 2083.06 FEET.
******************
 FLOW PROCESS FROM NODE 20643.00 TO NODE 20644.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 2100.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2068.00
 FLOW LENGTH (FEET) = 663.17 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 8.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.79
 PIPE-FLOW(CFS) = 23.87
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 17.39
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20644.00 = 2746.23 FEET.
FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

File name: LR0206ZZ.RES

Page 32

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

Date: 04/21/2014

LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET. \_\_\_\_\_ MAINLINE Tc(MIN.) = 17.39\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.018 SUBAREA LOSS RATE DATA (AMC II): FLOW PROCESS FROM NODE 20644.00 TO NODE 20645.00 IS CODE = 63 DEVELOPMENT TYPE/ SCS SOIL AREA \_\_\_\_\_\_ Fρ Дp LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA RESIDENTIAL >>>> (STREET TABLE SECTION # 5 USED) <<<< "8-10 DWELLINGS/ACRE" B 1.89 0.75 0.400 56 \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2068.00 DOWNSTREAM ELEVATION(FEET) = 2059.00 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.02 0.75 0.600 56 STREET LENGTH (FEET) = 221.04 CURB HEIGHT (INCHES) = 6.0 В 0.11 STREET HALFWIDTH (FEET) = 18.00 COMMERCIAL 0.75 0.100 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 SUBAREA AREA (ACRES) = 2.02 SUBAREA RUNOFF (CFS) = 3.14 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 EFFECTIVE AREA(ACRES) = 17.63 AREA-AVERAGED Fm(INCH/HR) = 0.36 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.52TOTAL AREA (ACRES) = 17.6 PEAK FLOW RATE (CFS) = 26.26 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 134.71 \*\*\*STREET FLOWING FULL\*\*\* >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.70>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES \_\_\_\_\_\_ HALFSTREET FLOOD WIDTH (FEET) = 28.02 TOTAL NUMBER OF STREAMS = 2 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.20 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 5.74 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 17.39STREET FLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 29.56 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.468 RAINFALL INTENSITY (INCH/HR) = 2.02AREA-AVERAGED Fm(INCH/HR) = 0.36SUBAREA LOSS RATE DATA (AMC II): AREA-AVERAGED Fp (INCH/HR) = 0.70 DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA AREA-AVERAGED Ap = 0.52LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN EFFECTIVE STREAM AREA(ACRES) = 17.63 RESIDENTIAL "8-10 DWELLINGS/ACRE" B 0.33 TOTAL STREAM AREA(ACRES) = 17.63 0.75 0.400 PEAK FLOW RATE (CFS) AT CONFLUENCE = 26.26 В 2.57 0.75 0.100 COMMERCIAL RESIDENTIAL ".4 DWELLING/ACRE" B 6.71 \*\* CONFLUENCE DATA \*\* 0.75 0.900 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER RESIDENTIAL "3-4 DWELLINGS/ACRE" B 9.85 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 0.75 0.600 1 108.25 29.11 1.482 0.72(0.47) 0.66 119.3 20620.00 B 0.01 0.75 0.250 56 MOBILE HOME PARK 2 26.26 17.39 2.018 0.70(0.36) 0.52 17.6 20640.00 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634 SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 17.42 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO EFFECTIVE AREA (ACRES) = 156.44 AREA-AVERAGED Fm (INCH/HR) = 0.46 CONFLUENCE FORMULA USED FOR 2 STREAMS. AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.64\*\* PEAK FLOW RATE TABLE \*\* TOTAL AREA(ACRES) = 156.4 PEAK FLOW RATE(CFS) = 141.75 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 1 125.37 17.39 2.018 0.72(0.45) 0.63 88.9 20640.00 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89 126.00 29.11 1.482 0.72(0.46) 0.64 137.0 20620.00 END OF SUBAREA STREET FLOW HYDRAULICS: COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 28.57 PEAK FLOW RATE (CFS) = 126.00 Tc (MIN.) = 29.11 FLOW VELOCITY (FEET/SEC.) = 8.31 DEPTH\*VELOCITY (FT\*FT/SEC.) = 5.91 EFFECTIVE AREA(ACRES) = 136.97 AREA-AVERAGED Fm(INCH/HR) = 0.46 \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.64ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1 TOTAL AREA (ACRES) = 137.0 ASSUME FULL-FLOWING PIPELINE

Date: 04/21/2014 Page 33 Date: 04/21/2014 File name: LR0206ZZ.RES Page 34 File name: LR020677.RFS

56

56

```
PIPE-FLOW VELOCITY(FEET/SEC.) = 13.38
                    42.08
 PIPE-FLOW(CFS) =
 PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 29.38
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.473
 SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 17.51
 TOTAL AREA (ACRES) = 156.4 PEAK FLOW RATE (CFS) = 142.48
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 100.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.03
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.85
  ** PEAK FLOW RATE TABLE **
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 150.58 17.67 1.999 0.72(0.46) 0.63 108.4 20640.00
         142.48 29.38 1.473 0.72(0.46) 0.64 156.4 20620.00
     2
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 150.58 Tc (MIN.) = 17.67
 AREA-AVERAGED Fm (INCH/HR) = 0.46 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.63 EFFECTIVE AREA(ACRES) = 108.42
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20645.00 = 4966.14 FEET.
******************
 FLOW PROCESS FROM NODE 20645.00 TO NODE 20646.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2059.00 DOWNSTREAM ELEVATION(FEET) = 2046.00
 STREET LENGTH (FEET) = 302.67 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 162.94
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.85
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.47
 STREET FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 18.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.961
```

File name: LR0206ZZ.RES

Page 35

Date: 04/21/2014

CURRENT TOOK PARE PARE (A	MO TT)				
SUBAREA LOSS RATE DATA (A DEVELOPMENT TYPE/			En	7.5	CCC
DEVELOPMENT TIPE/	SCS SOIT	AREA (ACDEC)	rp (TNCU/UD)	AP	SCS
LAND USE RESIDENTIAL	GROUP	(ACKES)	(INCH/HK)	(DECIMAL)	CIV
RESIDENTIAL					
"8-10 DWELLINGS/ACRE" COMMERCIAL	D D	5.00	0.75	0.400	56
RESIDENTIAL	В	5.79	0.75	0.100	36
"5-7 DWELLINGS/ACRE"	D	0.74	0.75	0 500	E.C.
	В	0.74	0.75	0.500	36
RESIDENTIAL ".4 DWELLING/ACRE"	В	0 00	0.75	0 000	F.C
			0.75		36
SUBAREA AVERAGE PERVIOUS	LOSS RA	TE, FP(IN	CH/HR) = 0	. /5	
SUBAREA AVERAGE PERVIOUS				~\ 0.4	<b></b>
SUBAREA AREA (ACRES) =					
EFFECTIVE AREA(ACRES) =					= 0.61
AREA-AVERAGED Fp (INCH/HF	(1) = 0./	2 AREA-A	VERAGED Ap	= 0.84	
TOTAL AREA (ACRES) =	172.3	PEA	K FLOW RATE	(CFS) =	151.11
SUBAREA AREA-AVERAGED RA					
5M = 0.36; 30M = 0.73; 1	HR = 0.9	6; 3HR =	1.64; 6HR =	2.29; 24H	R = 4.89
END OF SUBAREA STREET FI					
DEPTH(FEET) = 0.72 HAI					
FLOW VELOCITY (FEET/SEC.)				*FT/SEC.)	= 6.20
** PIPE SIZED TO CARRY T					
ESTIMATED PIPE DIAMETER (	INCH) =	24.00	NUMBER OF	PIPES =	1
ASSUME FULL-FLOWING PIPE					
PIPE-FLOW VELOCITY (FEET/		13.74			
PIPE-FLOW(CFS) = 43	.22				
PIPEFLOW TRAVEL TIME (MIN	(.) = 0	.37 Tc	(MIN.) = 1	8.04	
* 25 YEAR RAINFALL INTE					
SUBAREA AREA(ACRES) =	15.83	SUBARE	A RUNOFF (CF	S) = 24.	91
SUBAREA AREA(ACRES) = TOTAL AREA(ACRES) =	172.3	PEA	K FLOW RATE	(CFS) =	152.62
SUBAREA AREA-AVERAGED RA	INFALL D	EPTH (INCH	):		
5M = 0.36; 30M = 0.73; 1	HR = 0.9	6; 3HR =	1.64; 6HR =	2.29; 24H	R = 4.89
STREETFLOW HYDRAULICS BA	SED ON M	AINLINE T	c :		
STREET HYDRAULICS COMPUT	ED USING	ESTIMATE	D FLOW(CFS)	= 109.40	
***STREET FLOWING FULI	***				
STREETFLOW MODEL RESUL	TS USING	ESTIMATE	D FLOW:		
STREET FLOW DEPTH (FEET	= 0.6	5			
HALFSTREET FLOOD WIDTH	(FEET) =	25.58			
AVERAGE FLOW VELOCITY(	FEET/SEC	.) = 7	.92		
PRODUCT OF DEPTH&VELOC	ITY(FT*F	T/SEC.) =	5.16		
** PEAK FLOW RATE TABLE	**				
STREAM Q Tc	Intens	itv Fp(	Fm) Ap	Ae	HEADWATER
NUMBER (CFS) (MIN.	) (INCH/	HR) (INCH	/HR)	(ACRES)	NODE
NUMBER (CFS) (MIN. 1 173.10 18.0 2 158.56 29.7	4 1.9	75 0.72(	0.43) 0.59	124.2	20640.00
2 158.56 29.7	5 1.4	62 0.72 (	0.44) 0.61	172.3	20620.00
NEW PEAK FLOW DATA ARE:			,		
PEAK FLOW RATE(CFS) =	173.10	Tc (MIN.	) = 18.04		
AREA-AVERAGED Fm (INCH/HF					0.72
AREA-AVERAGED Ap = $0.59$					· · · · ·
LONGEST FLOWPATH FROM NO					68 81 FEET
TOWOLD I LOWINIII FROM INC		0.00 IO IV	20010.	55 52	OO.OI FEEL.
********	*****	******	******	******	*****
FLOW PROCESS FROM NODE					

```
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
                                                                          FLOW LENGTH (FEET) = 149.90 MANNING'S N = 0.013
_____
                                                                          DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.1 INCHES
 ELEVATION DATA: UPSTREAM(FEET) = 2046.00 DOWNSTREAM(FEET) = 2030.00
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 24.31
 FLOW LENGTH (FEET) = 325.06 MANNING'S N = 0.013
                                                                          ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.5 INCHES
                                                                          PIPE-FLOW(CFS) = 332.15
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.97
                                                                          PIPE TRAVEL TIME (MIN.) = 0.10 Tc (MIN.) = 18.37
 ESTIMATED PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
                                                                          LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
 PIPE-FLOW(CFS) = 173.10
                                                                        ***********************
 PIPE TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 18.26
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20647.00 = 5593.87 FEET.
                                                                          FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 81
*****
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20647.00 TO NODE 20647.00 IS CODE = 81
                                                                        ______
                                                                          MAINLINE Tc(MIN.) = 18.37
                                                                          * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.953
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                          SUBAREA LOSS RATE DATA(AMC II):
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
 MAINLINE Tc(MIN.) = 18.26
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.960
                                                                              LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          RESIDENTIAL
                                                                          "5-7 DWELLINGS/ACRE" B 0.31 0.75 0.500
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                  Fρ
                                           αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MOBILE HOME PARK
                    В
                           20.06
                                     0.75
                                            0.250
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 RESIDENTIAL
                                                                          SUBAREA AREA(ACRES) = 0.31 SUBAREA RUNOFF(CFS) = 0.44
 ".4 DWELLING/ACRE" B 29.79
                                     0.75
                                            0.900
                                                  56
                                                                          EFFECTIVE AREA(ACRES) = 237.28 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.55
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.97
                                     0.75
                                            0.600
                                                                          TOTAL AREA (ACRES) = 285.3
                                                  56
                                                                                                       PEAK FLOW RATE (CFS) = 332.15
 RESIDENTIAL
                                                                          NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                      B 13.31
 "8-10 DWELLINGS/ACRE"
                                     0.75
                                            0.400
                                                  56
 COMMERCIAL
                            16.98
                                     0.75
                                            0.100
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   В 17.61
                                     0.75 0.500
                                                                         ******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
                                                                          FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 11
 SUBAREA AREA(ACRES) = 112.72 SUBAREA RUNOFF(CFS) = 160.70
 EFFECTIVE AREA(ACRES) = 236.97 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                          >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.68
                                                                        TOTAL AREA (ACRES) = 285.0 PEAK FLOW RATE (CFS) = 311.67
                                                                          ** MAIN STREAM CONFLUENCE DATA **
                                                                                    Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                           1
                                                                                   332.15 18.37 1.953 0.73(0.40) 0.55 237.3 20640.00
                                                                                   267.03 30.09
                                                                                               1.452 0.73(0.41)0.57 285.3 20620.00
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
         332.15 18.26 1.960 0.73 (0.40) 0.55 237.0 20640.00
                                                                          ** MEMORY BANK # 1 CONFLUENCE DATA **
   1
         267.03 29.98 1.456 0.73 (0.41) 0.57 285.0 20620.00
                                                                                  Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 NEW PEAK FLOW DATA ARE:
                                                                           NUMBER
 PEAK FLOW RATE (CFS) = 332.15 Tc (MIN.) = 18.26
                                                                            1
                                                                                   152.81 25.29 1.612 0.75(0.44) 0.58 144.5 20600.00
 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.73
                                                                          LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5637.07 FEET.
 AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 236.97
                                                                          ** PEAK FLOW RATE TABLE **
*****************
                                                                           STREAM Q Tc Intensity Fp(Fm) Ap Ae
 FLOW PROCESS FROM NODE 20647.00 TO NODE 20648.00 IS CODE = 31
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            1
                                                                                   475.34 18.37 1.953 0.74(0.41) 0.56 342.2 20640.00
                                                                                   446.54 25.29 1.612 0.74(0.42) 0.57 410.1 20600.00
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
                                                                            3
                                                                                   399.06 30.09 1.452 0.74(0.42)0.57 429.8 20620.00
                                                                           TOTAL AREA(ACRES) =
                                                                                                429.8
      Date: 04/21/2014 File name: LR0206ZZ.RES
                                                 Page 37
```

>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 File name: LR0206ZZ.RES Page 38

HEADWATER

ELEVATION DATA: UPSTREAM(FEET) = 2030.00 DOWNSTREAM(FEET) = 2025.00

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 475.34 Tc (MIN.) = 18.365
 EFFECTIVE AREA(ACRES) = 342.20 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 429.8
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
******************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
*************************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20655.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 2025.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 623.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 480.18
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.42
   HALFSTREET FLOOD WIDTH (FEET) = 63.85
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.27
 STREET FLOW TRAVEL TIME (MIN.) = 1.78 Tc (MIN.) = 20.15
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.848
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                             Ар
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                              2.58
                                       0.75
                                               0.500 56
 COMMERCIAL
                      В
                               3.03
                                       0.75
                                               0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.11
                                       0.75
                                               0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                              1.00
                                       0.75
                                               0.700 56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                              0.08
                                       0.61
                                             1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.359
 SUBAREA AREA(ACRES) = 6.80
                              SUBAREA RUNOFF(CFS) = 9.68
```

```
EFFECTIVE AREA(ACRES) = 349.00 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
 TOTAL AREA(ACRES) = 436.6
                                 PEAK FLOW RATE (CFS) = 475.34
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.41 HALFSTREET FLOOD WIDTH(FEET) = 63.61
 FLOW VELOCITY (FEET/SEC.) = 5.82 DEPTH*VELOCITY (FT*FT/SEC.) = 8.22
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 12.70
 PIPE-FLOW(CFS) = 389.88
 PIPEFLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 19.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.903
 SUBAREA AREA(ACRES) = 6.80 SUBAREA RUNOFF(CFS) = 10.01
 TOTAL AREA (ACRES) = 436.6 PEAK FLOW RATE (CFS) = 475.34
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 85.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 32.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.12
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET.
****************
 FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.18
 RAINFALL INTENSITY (INCH/HR) = 1.90
 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.56
 EFFECTIVE STREAM AREA(ACRES) = 349.00
 TOTAL STREAM AREA(ACRES) = 436.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 475.34
FLOW PROCESS FROM NODE 20649.00 TO NODE 20650.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 39

File name: LR0206ZZ.RES

Page 40

Date: 04/21/2014

```
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
  INITIAL SUBAREA FLOW-LENGTH (FEET) = 545.44
                                                                                   SUBAREA AREA(ACRES) = 8.79 SUBAREA RUNOFF(CFS) = 17.67
                                                                                   EFFECTIVE AREA(ACRES) = 15.94 AREA-AVERAGED Fm(INCH/HR) = 0.51
 ELEVATION DATA: UPSTREAM(FEET) = 2195.00 DOWNSTREAM(FEET) = 2170.00
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                   TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) =
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.492
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.902
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                  Aр
                                                         SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
     LAND USE
                                                                                   DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.21
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.54
                                          0.75 0.700
                                                        56 10.09
                                                                                   FLOW VELOCITY (FEET/SEC.) = 7.51 DEPTH*VELOCITY (FT*FT/SEC.) = 3.08
                                                                                   LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20651.00 = 920.04 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61 0.75 0.600 56 9.49
                                                                                  *****************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                                                                                   FLOW PROCESS FROM NODE 20651.00 TO NODE 20652.00 IS CODE = 63
 SUBAREA RUNOFF(CFS) = 15.42
 TOTAL AREA (ACRES) = 7.15 PEAK FLOW RATE (CFS) =
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  ______
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                   UPSTREAM ELEVATION(FEET) = 2130.00 DOWNSTREAM ELEVATION(FEET) = 2080.00
                                                                                   STREET LENGTH (FEET) = 427.12 CURB HEIGHT (INCHES) = 6.0
************************
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20650.00 TO NODE 20651.00 IS CODE = 63
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2130.00
 STREET LENGTH (FEET) = 374.60 CURB HEIGHT (INCHES) = 6.0
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREET FLOW DEPTH (FEET) = 0.43
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 15.15
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.14
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.49
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 11.26
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.619
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                                                        Fр
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH (FEET) = 0.38
                                                                                        LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
                                                                                   RESIDENTIAL
                                                                                                         B 6.22 0.75 0.700
                                                                                   "2 DWELLINGS/ACRE"
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.66
                                                                                   RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 10.39
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                         B 1.35 0.75 0.600
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.750
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
                                                                                   SUBAREA AREA (ACRES) = 7.57 SUBAREA RUNOFF (CFS) = 14.37
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   EFFECTIVE AREA(ACRES) = 23.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
     LAND USE
 RESIDENTIAL
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 "2 DWELLINGS/ACRE" B
                               7.90
                                                  0.700
                                                        56
                                                                                   TOTAL AREA (ACRES) = 23.5 PEAK FLOW RATE (CFS) =
                                          0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                 0.89
                                          0.75
                                                  0.600
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Page 41

Date: 04/21/2014

File name: LR0206ZZ.RES

Date: 04/21/2014

File name: LR0206ZZ.RES

32.10

SCS

56

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.93
 FLOW VELOCITY (FEET/SEC.) = 8.40 DEPTH*VELOCITY (FT*FT/SEC.) = 3.74
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20652.00 = 1347.16 FEET.
*******************
 FLOW PROCESS FROM NODE 20652.00 TO NODE 20653.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2080.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 432.48 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.49
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.69
 STREET FLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 12.18
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.499
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 3.90
                                       0.75
                                               0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 4.35 SUBAREA RUNOFF (CFS) = 7.76
 EFFECTIVE AREA(ACRES) = 27.86 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 27.9 PEAK FLOW RATE(CFS) = 49.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.41
 FLOW VELOCITY (FEET/SEC.) = 7.91 DEPTH*VELOCITY (FT*FT/SEC.) = 3.75
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20653.00 = 1779.64 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
 STREET LENGTH (FEET) = 283.32 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 51.93
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.54
  HALFSTREET FLOOD WIDTH (FEET) = 20.15
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.87
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.19
 STREET FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 12.99
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.405
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                             Aρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                     B 0.22 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.46 0.75 0.600
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 1.74 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
 SUBAREA AREA(ACRES) = 2.42 SUBAREA RUNOFF(CFS) = 4.22
 EFFECTIVE AREA(ACRES) = 30.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 30.3 PEAK FLOW RATE (CFS) =
                                                       51.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 FLOW VELOCITY (FEET/SEC.) = 5.87 DEPTH*VELOCITY (FT*FT/SEC.) = 3.18
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20654.00 = 2062.96 FEET.
*****************
 FLOW PROCESS FROM NODE 20654.00 TO NODE 20655.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2030.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
```

File name: LR0206ZZ.RES

Page 44

Date: 04/21/2014

FLOW PROCESS FROM NODE 20653.00 TO NODE 20654.00 IS CODE = 63

```
STREET HALFWIDTH (FEET) = 18.00
                                                                                 ** CONFLUENCE DATA **
                                                                                 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR)
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  1
                                                                                          475.34 19.18 1.903 0.74(0.41) 0.56 349.0 20640.00
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  1 446.54 26.11 1.582 0.74(0.42) 0.56 416.9 20600.00
                                                                                          399.06 30.91 1.429 0.74(0.42) 0.57 436.6 20620.00
                                                                                  1
                                                                                          51.67 13.38 2.362 0.75(0.50) 0.67 30.7 20649.00
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
                                                                                 ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.10
                                                                                 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
   ***STREET FLOWING FULL***
                                                                                 NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 1
                                                                                          485.18 13.38 2.362 0.74(0.42) 0.57 274.1 20649.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
                                                                                          514.25 19.18 1.903 0.74(0.42) 0.56 379.7 20640.00
                                                                                    3
                                                                                          476.52 26.11 1.582 0.74(0.42) 0.57 447.6 20600.00
   HALFSTREET FLOOD WIDTH (FEET) = 18.32
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.00
                                                                                          424.80 30.91 1.429 0.74(0.43) 0.58 467.2 20620.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.54
 STREET FLOW TRAVEL TIME (MIN.) = 0.39 Tc (MIN.) = 13.38
                                                                                 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.362
                                                                                 PEAK FLOW RATE (CFS) = 514.25 Tc (MIN.) = 19.18
                                                                                 EFFECTIVE AREA(ACRES) = 379.69 AREA-AVERAGED Fm(INCH/HR) = 0.42
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN ERCIAL B 0.41 0.75 0.100 56
                                                                                TOTAL AREA(ACRES) = 467.2
                                                                                LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET.
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               ******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA(ACRES) = 0.41 SUBAREA RUNOFF(CFS) = 0.84
                                                                                FLOW PROCESS FROM NODE 20655.00 TO NODE 20656.00 IS CODE = 63
 EFFECTIVE AREA(ACRES) = 30.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 TOTAL AREA (ACRES) = 30.7
                               PEAK FLOW RATE (CFS) = 51.67
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               ______
                                                                                 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2014.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 STREET LENGTH (FEET) = 238.44 CURB HEIGHT (INCHES) = 6.0
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.32
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 FLOW VELOCITY (FEET/SEC.) = 6.94 DEPTH*VELOCITY (FT*FT/SEC.) = 3.52
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20655.00 = 2227.52 FEET.
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
*********************
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.85
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 516.75
                                                                                  ***STREET FLOWING FULL***
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TIME OF CONCENTRATION (MIN.) = 13.38
                                                                                  STREET FLOW DEPTH (FEET) = 1.19
 RAINFALL INTENSITY (INCH/HR) = 2.36
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 52.44
 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.27
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 11.02
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.67
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.43 Tc (MIN.) = 19.61
 EFFECTIVE STREAM AREA(ACRES) = 30.69
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.878
 TOTAL STREAM AREA(ACRES) = 30.69
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 51.67
```

Page 45

STREET LENGTH (FEET) = 164.56 CURB HEIGHT (INCHES) = 6.0

Date: 04/21/2014 File name: LR0206ZZ.RES

Date: 04/21/2014 File name: LR0206ZZ.RES Page 46

SCS

(ACRES) NODE

LAND USE	GROUP (ACRES) (INCH/HR)	(DECIMAL) CN	
RESIDENTIAL		, , ,	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
"5-7 DWELLINGS/ACRE"	B 0.66 0.75	0.500 56	INSIDE STREET CROSSFALL(DECIMAL) = 0.020
COMMERCIAL	B 1.28 0.75	0.100 56	OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
RESIDENTIAL "3-4 DWELLINGS/ACRE"	в 0.16 0.75	0.600 56	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
RESIDENTIAL			STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
	B 1.49 0.75  JS LOSS RATE, Fp(INCH/HR) = 0.  JS AREA FRACTION, Ap = 0.445	0.700 56 75	Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86
	3.59 SUBAREA RUNOFF(CFS	) - 1 00	MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86
EFFECTIVE AREA(ACRES) =	= 383.28 AREA-AVERAGED Fm HR) = 0.74 AREA-AVERAGED Ap =	(INCH/HR) = 0.42	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 540.04 ***STREET FLOWING FULL***
	470.8 PEAK FLOW RATE (		STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
,	EFAULTED TO UPSTREAM VALUE	011,120	STREET FLOW DEPTH (FEET) = 1.22 HALFSTREET FLOOD WIDTH (FEET) = 53.96
SUBAREA AREA-AVERAGED R	RAINFALL DEPTH(INCH): 1HR = 0.96; 3HR = 1.64; 6HR =	2 20. 2415 - 4 00	AVERAGE FLOW VELOCITY(FEET/SEC.) = 9.16 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 11.17
SM = 0.36; SOM = 0.73;	THR = 0.96; SHR = 1.64; 6HR =	2.29; 24HR = 4.89	STREET FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 20.15
END OF SUBAREA STREET F	THOW HYDRAULICS:		* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.848
	ALFSTREET FLOOD WIDTH(FEET) =	52.31	SUBAREA LOSS RATE DATA (AMC II):
FLOW VELOCITY (FEET/SEC.	) = 9.27 DEPTH*VELOCITY(FT*	FT/SEC.) = 11.00	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
			LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
	FLOW DEPTH IS GREATER THAN		RESIDENTIAL
	DWABLE STREET FLOW DEPTH (FEET)		"5-7 DWELLINGS/ACRE" B 0.99 0.75 0.500 56 COMMERCIAL B 2.55 0.75 0.100 56
	THE STREET CONSTRAINT AS FOLL TOTAL UPSTREAM PIPEFLOW **	OWS:	COMMERCIAL B 2.55 0.75 0.100 56 RESIDENTIAL
	R(INCH) = 63.00 NUMBER OF P	TPES = 1	"3-4 DWELLINGS/ACRE" B 3.13 0.75 0.600 56
ASSUME FULL-FLOWING PIP		1120 1	RESIDENTIAL
PIPE-FLOW VELOCITY (FEET	'/SEC.) = 20.03		"2 DWELLINGS/ACRE" B 35.47 0.75 0.700 56
PIPE-FLOW(CFS) = 43			SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
	IN.) = 0.20   Tc(MIN.) = 19	.38	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.652
	TENSITY(INCH/HR) = 1.891		SUBAREA AREA (ACRES) = 42.14 SUBAREA RUNOFF (CFS) = 51.58
	3.59 SUBAREA RUNOFF (CFS 470.8 PEAK FLOW RATE (		EFFECTIVE AREA(ACRES) = 425.42 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
· · ·	FAULTED TO UPSTREAM VALUE	CFS) = 514.25	TOTAL AREA (ACRES) = 513.0 PEAK FLOW RATE (CFS) = 545.11
NOIE. TEAR FROM RATE DE	TAGELED TO OFSTREAM VALUE		TOTAL ANDA (ACKED) - 313.0 TEAN THOW NATE (013) - 343.11
-	1HR = 0.96; 3HR = 1.64; 6HR =	2.29; 24HR = 4.89	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
STREETFLOW HYDRAULICS B	BASED ON MAINLINE TC : JTED USING ESTIMATED FLOW(CFS) :	= 80.36	END OF SUBAREA STREET FLOW HYDRAULICS:
***STREET FLOWING FUL		00.50	DEPTH(FEET) = 1.22 HALFSTREET FLOOD WIDTH(FEET) = 54.21
STREETFLOW MODEL RESU	JLTS USING ESTIMATED FLOW:		FLOW VELOCITY (FEET/SEC.) = 9.16 DEPTH*VELOCITY (FT*FT/SEC.) = 11.22
STREET FLOW DEPTH(FEE HALFSTREET FLOOD WIDT	•		*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
AVERAGE FLOW VELOCITY			THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
	CITY(FT*FT/SEC.) = 3.85		SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
	NODE 20620.00 TO NODE 20656.0	0 = 6605.94 FEET.	** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
			ESTIMATED PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1
	*********************		ASSUME FULL-FLOWING PIPELINE
	20656.00 TO NODE 20657.00 IS		PIPE-FLOW VELOCITY (FEET/SEC.) = 20.04
	DW TRAVEL TIME THRU SUBAREA<		PIPE-FLOW(CFS) = 476.65 PIPEFLOW TRAVEL TIME(MIN.) = 0.35 Tc(MIN.) = 19.73
>>>> (STREET TABLE SECT			* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.871
, -		=======================================	SUBAREA AREA (ACRES) = 42.14 SUBAREA RUNOFF (CFS) = 52.47
,	T) = 2014.00 DOWNSTREAM ELEVAT 422.05 CURB HEIGHT (INCHES)	,	TOTAL AREA (ACRES) = 513.0 PEAK FLOW RATE (CFS) = 554.04
STREET HALFWIDTH (FEET)			SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

 Date: 04/21/2014
 File name: LR0206ZZ.RES
 Page 47
 Date: 04/21/2014
 File name: LR0206ZZ.RES
 Page 48

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                    "2 DWELLINGS/ACRE"
                                                                                                        B 14.94
                                                                                                                            0.75
                                                                                                                                    0.700
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                   COMMERCIAL
                                                                                                           В 1.47
                                                                                                                            0.75
                                                                                                                                    0.100
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 77.40
                                                                                   NATURAL FAIR COVER
                                                                                                           B 1.34
   ***STREET FLOWING FULL***
                                                                                   "OPEN BRUSH"
                                                                                                                            0.61 1.000
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" B 1.78 0.75 0.600
   STREET FLOW DEPTH (FEET) = 0.64
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 25.15
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.78
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.653
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.72
                                                                                   SUBAREA AREA (ACRES) = 21.22 SUBAREA RUNOFF (CFS) = 24.55
                                                                                   EFFECTIVE AREA(ACRES) = 446.64 AREA-AVERAGED Fm(INCH/HR) = 0.43
  ** PEAK FLOW RATE TABLE **
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.58
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                   TOTAL AREA(ACRES) = 534.2 PEAK FLOW RATE(CFS) = 554.04
  STREAM
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                   NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
           540.39 13.93 2.306 0.74(0.43) 0.58 319.8 20649.00
    1
           554.04 19.73 1.871 0.74(0.42) 0.57
                                                 425.4 20640.00
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
           504.41 26.61 1.564 0.74(0.43) 0.58
                                                 493.3 20600.00
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
           455.41 31.40 1.416 0.74(0.43) 0.58 513.0 20620.00
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 554.04 Tc (MIN.) = 19.73
                                                                                   DEPTH(FEET) = 1.57 HALFSTREET FLOOD WIDTH(FEET) = 71.30
 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                                   FLOW VELOCITY (FEET/SEC.) = 5.41 DEPTH*VELOCITY (FT*FT/SEC.) = 8.47
 AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 425.42
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20657.00 = 7027.99 FEET.
                                                                                   *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
*****************
                                                                                   SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 FLOW PROCESS FROM NODE 20657.00 TO NODE 20658.00 IS CODE = 63
                                                                                   ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                   ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                   ASSUME FULL-FLOWING PIPELINE
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   PIPE-FLOW VELOCITY(FEET/SEC.) = 12.25
_____
                                                                                   PIPE-FLOW(CFS) = 505.95
 UPSTREAM ELEVATION(FEET) = 2004.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
                                                                                   PIPEFLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 20.62
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.822
 STREET LENGTH (FEET) = 653.95 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   SUBAREA AREA (ACRES) = 21.22 SUBAREA RUNOFF (CFS) = 25.63
                                                                                   TOTAL AREA (ACRES) = 534.2 PEAK FLOW RATE (CFS) = 560.96
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
                                                                                   STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 55.01
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     STREET FLOW DEPTH (FEET) = 0.71
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 28.63
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.21
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 566.32
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.29
   ***STREET FLOWING FULL***
                                                                                   ** PEAK FLOW RATE TABLE **
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.58
                                                                                    STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                              (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                   (ACRES) NODE
   HALFSTREET FLOOD WIDTH (FEET) = 71.91
                                                                                    NUMBER
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.44
                                                                                     1
                                                                                             549.44 14.82 2.222 0.74(0.43) 0.58 341.0 20649.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 8.58
                                                                                      2 560.96 20.62 1.822 0.74(0.43) 0.58 446.6 20640.00
 STREET FLOW TRAVEL TIME (MIN.) = 2.00 Tc (MIN.) = 21.74
                                                                                             512.66 27.39 1.537 0.74(0.43) 0.58 514.5 20600.00
                                                                                             463.09 32.20 1.395 0.74(0.43) 0.58
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.765
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   NEW PEAK FLOW DATA ARE:
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                   PEAK FLOW RATE (CFS) = 560.96 Tc (MIN.) = 20.62
                                      Fр
                                                Ар
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                                   AREA-AVERAGED Ap = 0.58 EFFECTIVE AREA(ACRES) = 446.64
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     В 1.69 0.75
                                                  0.500 56
                                                                                   LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
 RESIDENTIAL
```

56

56

66

56

534.2 20620.00

Date: 04/21/2014 Page 49 Date: 04/21/2014 File name: LR020677.RFS File name: LR020677.RFS Page 50 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<

\_\_\_\_\_

PEAK FLOWRATE TABLE FILE NAME: 20658.DNA

\_\_\_\_\_\_

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 534.2 TC (MIN.) = 20.62

EFFECTIVE AREA(ACRES) = 446.64 AREA-AVERAGED Fm(INCH/HR) = 0.43

AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.576

PEAK FLOW RATE (CFS) = 560.96

\_\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0206ZZ.RES Page 51 Date: 04/21/2014 File name: LR0206ZZ.RES Page 52

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20764

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20/

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT \*

FILE NAME: LR0207ZZ.DAT

TIME/DATE OF STUDY: 08:03 11/19/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	==========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20700.00 TO NODE 20701.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 906.02 ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2130.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.204 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.627 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE NATURAL FAIR COVER "OPEN BRUSH" B 5.30 0.61 1.000 66 19.20 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.69 0.75 0.600 56 11.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.812 SUBAREA RUNOFF(CFS) = 18.80 9.99 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 18.80 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20701.00 TO NODE 20702.00 IS CODE = 92 \_\_\_\_\_\_ >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 2130.00 DOWNSTREAM NODE ELEVATION (FEET) = 2080.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 502.90 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250

File name: LR0207ZZ.RES

Page 2

Date: 04/21/2014

```
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.517
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.19
                                         0.75
                                                 0.600
                                                         56
 NATURAL FAIR COVER
                         B 2.38
 "OPEN BRUSH"
                                         0.61
                                                 1.000
                                                         66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.08
                                       0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.10
 AVERAGE FLOW DEPTH(FEET) = 0.50 FLOOD WIDTH(FEET) = 20.70
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 12.03
 SUBAREA AREA(ACRES) = 6.65
                                SUBAREA RUNOFF(CFS) = 12.04
 EFFECTIVE AREA(ACRES) = 16.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
                                 PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 16.6
                                                           29.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.52 FLOOD WIDTH (FEET) = 23.39
 FLOW VELOCITY (FEET/SEC.) = 10.08 DEPTH*VELOCITY (FT*FT/SEC) = 5.27
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20702.00 = 1408.92 FEET.
*******************
 FLOW PROCESS FROM NODE 20702.00 TO NODE 20703.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 2080.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2075.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 222.67
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.433
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.10
                                      0.75
                                                 0.600
 NATURAL FAIR COVER
                        B 3.64 0.61
 "OPEN BRUSH"
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.854
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.70
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.30
 AVERAGE FLOW DEPTH(FEET) = 0.64 FLOOD WIDTH(FEET) = 37.28
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 12.73
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 3

```
EFFECTIVE AREA(ACRES) = 22.38 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 22.4
                               PEAK FLOW RATE(CFS) =
                                                        38.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.66 FLOOD WIDTH (FEET) = 39.07
 FLOW VELOCITY (FEET/SEC.) = 5.38 DEPTH*VELOCITY (FT*FT/SEC) = 3.53
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20703.00 = 1631.59 FEET.
******************
 FLOW PROCESS FROM NODE 20703.00 TO NODE 20704.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2075.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2070.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 175.13
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.379
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В 0.53
                                       0.61
                                               1.000
                                                      66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.24
                                       0.75
                                               0.400
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             2.09 0.75 0.600
                                                      56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.76
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.01
 AVERAGE FLOW DEPTH (FEET) = 0.65 FLOOD WIDTH (FEET) = 38.02
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 13.22
 SUBAREA AREA (ACRES) = 2.86 SUBAREA RUNOFF (CFS) = 4.92
 EFFECTIVE AREA(ACRES) = 25.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 25.2
                               PEAK FLOW RATE(CFS) =
                                                        42.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.65 FLOOD WIDTH (FEET) = 38.62
 FLOW VELOCITY (FEET/SEC.) = 6.04 DEPTH*VELOCITY (FT*FT/SEC) = 3.94
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20704.00 = 1806.72 FEET.
FLOW PROCESS FROM NODE 20704.00 TO NODE 20705.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
```

SUBAREA RUNOFF(CFS) = 9.71

SUBAREA AREA(ACRES) = 5.74

```
***STREET FLOWING FULL***
_____
 UPSTREAM NODE ELEVATION (FEET) = 2070.00
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 DOWNSTREAM NODE ELEVATION (FEET) = 2065.00
                                                                                  STREET FLOW DEPTH(FEET) = 0.62
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.79
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 24.18
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.66
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.90
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 15.04
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.202
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.305
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fр
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                 Ap SCS
                                                                                     LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 NATURAL FAIR COVER
     LAND USE
 RESIDENTIAL
                                                                                 "OPEN BRUSH"
                                                                                                      В 3.14
                                                                                                                        0.61
                                                                                                                               1.000
 "8-10 DWELLINGS/ACRE" B 4.91
                                        0.75
                                                0.400
                                                      56
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.43
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                                                        56
 "3-4 DWELLINGS/ACRE"
                    В 2.39
                                        0.75
                                                0.600
                                                       56
                                                                                 RESIDENTIAL
 NATURAL FAIR COVER
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                     В
                                                                                                             0.92
                                                                                                                       0.75 0.400
                                                                                                                                       56
 "OPEN BRUSH"
                        В
                           0.79 0.61 1.000
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.839
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518
                                                                                 SUBAREA AREA(ACRES) = 4.49
                                                                                                              SUBAREA RUNOFF (CFS) = 6.74
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 49.16
                                                                                 EFFECTIVE AREA(ACRES) = 37.82 AREA-AVERAGED Fm(INCH/HR) = 0.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.48
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
 AVERAGE FLOW DEPTH(FEET) = 0.70 FLOOD WIDTH(FEET) = 44.30
                                                                                 TOTAL AREA(ACRES) = 37.8
                                                                                                               PEAK FLOW RATE(CFS) =
                                                                                                                                         58.14
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 13.94
 SUBAREA AREA(ACRES) = 8.09 SUBAREA RUNOFF(CFS) = 14.06
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 33.33 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) =
                                                          54.49
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.24
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.66 DEPTH*VELOCITY (FT*FT/SEC.) = 2.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20706.00 = 2351.93 FEET.
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                               ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.72 FLOOD WIDTH (FEET) = 46.39
                                                                                 FLOW PROCESS FROM NODE 20706.00 TO NODE 20707.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 5.57 DEPTH*VELOCITY (FT*FT/SEC) = 4.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20705.00 = 2043.51 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 FLOW PROCESS FROM NODE 20705.00 TO NODE 20706.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2055.00
______
                                                                                 STREET LENGTH (FEET) = 216.66 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 308.42 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   58.79
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                  STREET FLOW DEPTH(FEET) = 0.60
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 57.86
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.29
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 5 Date: 04/21/2014 File name: LR0207ZZ.RES Page 6

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 15.73
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                         B 1.39
                                                                                                                         0.75
                                                                                                                                 0.700
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.144
                                                                                 RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                        B 1.58 0.75 0.400
                                                                                                                                        56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                        Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
                                                                                 SUBAREA AREA (ACRES) = 7.33 SUBAREA RUNOFF (CFS) = 10.22
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78
                                         0.75 0.400 56
                                                                                 EFFECTIVE AREA(ACRES) = 45.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
                                                                                 TOTAL AREA (ACRES) = 45.9 PEAK FLOW RATE (CFS) =
                                                                                                                                          65.42
 SUBAREA AREA(ACRES) = 0.78 SUBAREA RUNOFF(CFS) = 1.29
 EFFECTIVE AREA(ACRES) = 38.60 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                               PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 38.6
                                                         58.14
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH (FEET) = 0.56 HALFSTREET FLOOD WIDTH (FEET) = 21.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.85 DEPTH*VELOCITY (FT*FT/SEC.) = 3.83
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20708.00 = 2906.50 FEET.
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.65
                                                                                  FLOW PROCESS FROM NODE 20708.00 TO NODE 20709.00 IS CODE = 63
                                                                                ______
 FLOW VELOCITY (FEET/SEC.) = 5.29 DEPTH*VELOCITY (FT*FT/SEC.) = 3.14
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20707.00 = 2568.59 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 14 USED) <<<<
******************
                                                                                _____
 FLOW PROCESS FROM NODE 20707.00 TO NODE 20708.00 IS CODE = 63
                                                                                  UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2035.00
-----
                                                                                 STREET LENGTH (FEET) = 377.00 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 39.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 UPSTREAM ELEVATION(FEET) = 2055.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 337.91 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                    68.63
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH(FEET) = 0.89
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.72
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 47.97
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.60
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.10
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   63.26
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 17.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.982
   STREET FLOW DEPTH (FEET) = 0.56
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 20.76
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                 αA
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.76
                                                                                     LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.76
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 16.56
                                                                                                        B 0.45
                                                                                                                         0.75
                                                                                                                                 0.700
                                                                                                                                         56
                                                                                  "2 DWELLINGS/ACRE"
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.078
                                                                                 NATURAL FAIR COVER
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "OPEN BRUSH"
                                                                                                         B 1.33
                                                                                                                         0.61
                                                                                                                                 1.000
                                                                                                                                         66
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                        SCS
                                                                                 RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                                1.75
                                                                                                                         0.75
                                                                                                                                 0.400
                                                                                                                                         56
     LAND USE
 NATURAL FAIR COVER
                                                                                 RESIDENTIAL.
 "OPEN BRUSH"
                                4.36
                                         0.61
                                               1.000 66
                                                                                 "5-7 DWELLINGS/ACRE"
                                                                                                                1.06
                                                                                                                         0.75
                                                                                                                                 0.500
```

Date: 04/21/2014

File name: LR0207ZZ.RES

Page 8

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
                                                                                   TOTAL AREA (ACRES) =
                                                                                                     54.5 PEAK FLOW RATE(CFS) =
                                                                                                                                           69.91
 SUBAREA AREA(ACRES) = 4.59 SUBAREA RUNOFF(CFS) = 6.41
 EFFECTIVE AREA(ACRES) = 50.52 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 TOTAL AREA (ACRES) = 50.5 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.56
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.90 DEPTH*VELOCITY (FT*FT/SEC.) = 4.30
                                                                                  LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20710.00 = 3610.46 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 ******************
 DEPTH(FEET) = 0.89 HALFSTREET FLOOD WIDTH(FEET) = 47.66
 FLOW VELOCITY (FEET/SEC.) = 4.59 DEPTH*VELOCITY (FT*FT/SEC.) = 4.08
                                                                                   FLOW PROCESS FROM NODE 20710.00 TO NODE 20711.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20709.00 = 3283.50 FEET.
                                                                                 ______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                                  >>>> (STREET TABLE SECTION # 14 USED) <<<<
 FLOW PROCESS FROM NODE 20709.00 TO NODE 20710.00 IS CODE = 63
                                                                                 _____
                                                                                  UPSTREAM ELEVATION (FEET) = 2030.00 DOWNSTREAM ELEVATION (FEET) = 2025.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 298.59 CURB HEIGHT (INCHES) = 8.0
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 39.00
_____
 UPSTREAM ELEVATION(FEET) = 2035.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 STREET LENGTH (FEET) = 326.96 CURB HEIGHT (INCHES) = 8.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 39.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     73.36
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06
                                                                                    STREET FLOW DEPTH (FEET) = 0.88
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 46.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.14
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.52
   STREET FLOW DEPTH(FEET) = 0.88
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 20.00
   HALFSTREET FLOOD WIDTH (FEET) = 46.72
                                                                                   * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.856
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.32
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fр
                                                                                                                                   Αp
 STREET FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 19.03
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.912
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                                  4.34
                                                                                                                           0.75
                                                                                                                                  0.700
                                                                                                                                           56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                 Aр
                                                        SCS
                                                                                  NATURAL FAIR COVER
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   "OPEN BRUSH"
                                                                                                         в 0.10
                                                                                                                           0.61
                                                                                                                                  1.000
                                                                                                                                           66
 RESIDENTIAL
                                                                                  RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 0.82
                                         0.75
                                                 0.700
                                                       56
                                                                                  "8-10 DWELLINGS/ACRE"
                                                                                                                 0.27
                                                                                                                          0.75
                                                                                                                                  0.400
                                                                                                                                           56
 NATURAL FAIR COVER
                                                                                  RESIDENTIAL
 "OPEN BRUSH"
                                0.94
                                         0.61
                                                 1.000
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                          B
                                                                                                                0.92
                                                                                                                          0.75 0.500
                                                         66
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 "8-10 DWELLINGS/ACRE" B
                                1.18
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
                                         0.75
                                                 0.400
 RESIDENTIAL
                                                                                  SUBAREA AREA (ACRES) = 5.63 SUBAREA RUNOFF (CFS) = 6.92
                                               0.500 56
 "5-7 DWELLINGS/ACRE"
                       В
                              1.02
                                         0.75
                                                                                  EFFECTIVE AREA(ACRES) = 60.11 AREA-AVERAGED Fm(INCH/HR) = 0.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.630
                                                                                  TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA (ACRES) = 3.96 SUBAREA RUNOFF (CFS) = 5.25
 EFFECTIVE AREA(ACRES) = 54.48 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 9

Date: 04/21/2014 File name: LR0207ZZ.RES

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                         TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 21.52
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20713.00 = 4560.55 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                        DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 46.87
 FLOW VELOCITY (FEET/SEC.) = 5.14 DEPTH*VELOCITY (FT*FT/SEC.) = 4.53
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20713.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20711.00 = 3909.05 FEET.
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
*******************
                                                                        ______
 FLOW PROCESS FROM NODE 20711.00 TO NODE 20712.00 IS CODE = 54
                                                                         MAINLINE Tc (MIN.) = 21.52
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
______
                                                                             LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2025.00 DOWNSTREAM(FEET) = 2020.00
                                                                         RESIDENTIAL
                                                                                            В
 CHANNEL LENGTH THRU SUBAREA (FEET) = 279.66 CHANNEL SLOPE = 0.0179
                                                                         "2 DWELLINGS/ACRE"
                                                                                                     2.10
                                                                                                             0.75
                                                                                                                    0.700
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         NATURAL FAIR COVER
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "OPEN BRUSH"
                                                                                                     3.26
                                                                                                             0.61
                                                                                                                   1.000
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             74.08
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.88 FLOW DEPTH (FEET) = 1.55
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                            В 1.09
                                                                                                             0.75 0.500
 TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 20.79
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20712.00 = 4188.71 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818
                                                                         SUBAREA AREA (ACRES) = 6.45 SUBAREA RUNOFF (CFS) = 7.15
********************
                                                                         EFFECTIVE AREA(ACRES) = 69.90 AREA-AVERAGED Fm(INCH/HR) = 0.49
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20712.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
                                                                         TOTAL AREA(ACRES) = 69.9
                                                                                                      PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 20.79
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.813
                                                                        SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20714.00 IS CODE = 54
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "2 DWELLINGS/ACRE"
                   В
                            2.62
                                    0.75
                                           0.700
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                        ______
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 0.72 0.75
                                           0.500
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1960.00
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 732.38 CHANNEL SLOPE = 0.0546
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
                                                                         CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 SUBAREA AREA(ACRES) = 3.34
                            SUBAREA RUNOFF (CFS) = 3.97
                                                                         MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
 EFFECTIVE AREA(ACRES) = 63.45 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                     80.78
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.71
                                                                         FLOW VELOCITY (FEET/SEC.) = 8.99 FLOW DEPTH (FEET) = 1.21
                                                                         TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 22.88
 TOTAL AREA (ACRES) = 63.5
                            PEAK FLOW RATE(CFS) =
                                                   75.74
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20714.00 = 5292.93 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        ******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                         FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 81
*****************
                                                                        ______
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20713.00 IS CODE = 54
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        _____
                                                                         MAINLINE Tc(MIN.) = 22.88
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.712
_____
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 2000.00
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                    Αp
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.84 CHANNEL SLOPE = 0.0538
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             LAND USE
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.500
                                                                         NATURAL FAIR COVER
                                                                                                   2.63
                                                                                                             0.61
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
                                                                         "OPEN BRUSH"
                                                                                              В
                                                                                                                   1.000
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            75.74
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 8.53 FLOW DEPTH (FEET) = 1.13
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                                     1.94
                                                                                                             0.75
                                                                                                                    0.500
```

Date: 04/21/2014

File name: LR0207ZZ.RES

SCS

56

66

66

56

Page 12

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.788
 SUBAREA AREA(ACRES) = 4.57
                             SUBAREA RUNOFF(CFS) = 4.94
 EFFECTIVE AREA(ACRES) = 74.47 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 74.5 PEAK FLOW RATE(CFS) =
                                                     81.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
______
 FLOW PROCESS FROM NODE 20718.00 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.44
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.738
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.050
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Αр
                                                    SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.21
                                      0.75
                                              0.600
                                                    56 8.74
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             1.38
                                      0.61
                                             1.000
                                                    66 14.97
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            5.85
                                      0.75
                                             0.700
                                                    56 9.29
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.753
 SUBAREA RUNOFF (CFS) = 16.82
 TOTAL AREA (ACRES) = 7.44 PEAK FLOW RATE (CFS) = 16.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*********************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.74
 RAINFALL INTENSITY (INCH/HR) = 3.05
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 7.44
```

```
PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  16.82
FLOW PROCESS FROM NODE 20718.50 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 522.86
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.768
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.273
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Αp
                                                    SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.21
                                      0.75
                                             0.600
                                                    56
                                                       7.77
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             2.34
                                      0.61
                                            1.000
                                                    66 13.31
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                           4.69
                                      0.75 0.700
                                                        8.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.794
 SUBAREA RUNOFF(CFS) = 17.74
 TOTAL AREA (ACRES) = 7.24 PEAK FLOW RATE (CFS) = 17.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 7.77
 RAINFALL INTENSITY (INCH/HR) = 3.27
 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.79
 EFFECTIVE STREAM AREA(ACRES) = 7.24
 TOTAL STREAM AREA(ACRES) = 7.24
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               17.74
 ** CONFLUENCE DATA **
  STREAM
                 Tc Intensity Fp(Fm)
                                        Ар Ае
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
  1
           16.82 8.74 3.050 0.71(0.54)0.75 7.4 20718.00
          17.74 7.77 3.273 0.69(0.55) 0.79
                                                7.2 20718.50
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 14

TOTAL STREAM AREA(ACRES) = 7.44

```
** PEAK FLOW RATE TABLE **
  STREAM
                 Tc Intensity Fp(Fm)
                                       Ap Ae
           0
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          34.02 7.77 3.273 0.70(0.54)0.77 13.9 20718.50
           33.11 8.74 3.050 0.70(0.54) 0.77 14.7 20718.00
    2
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 34.02 Tc (MIN.) =
 EFFECTIVE AREA(ACRES) =
                     13.85 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 14.7
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20719.00 = 714.44 FEET.
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20722.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2040.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 351.50
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.117
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 5.48 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.42
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.85
 AVERAGE FLOW DEPTH(FEET) = 0.58 FLOOD WIDTH(FEET) = 30.41
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 8.43
 SUBAREA AREA(ACRES) = 5.48 SUBAREA RUNOFF(CFS) = 12.79
 EFFECTIVE AREA(ACRES) = 19.33 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.60 FLOOD WIDTH(FEET) = 32.05
 FLOW VELOCITY (FEET/SEC.) = 8.97 DEPTH*VELOCITY (FT*FT/SEC) = 5.35
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20722.00 = 1065.94 FEET.
******************
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.43
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 19.33
 TOTAL STREAM AREA(ACRES) = 20.16
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 44.86
******************
 FLOW PROCESS FROM NODE 20720.00 TO NODE 20721.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1046.89
 ELEVATION DATA: UPSTREAM(FEET) = 2105.00 DOWNSTREAM(FEET) = 2020.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.682
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.562
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Aр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 5.65 0.75 0.700
                                                      56 11.68
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 10.37
 TOTAL AREA (ACRES) = 5.65 PEAK FLOW RATE (CFS) = 10.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20721.00 TO NODE 20722.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 2020.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 115.32
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.525
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Aр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.32
                                       0.75
                                              0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                             4.12
                                       0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.70
 AVERAGE FLOW DEPTH(FEET) = 0.49 FLOOD WIDTH(FEET) = 19.50
```

RAINFALL INTENSITY (INCH/HR) = 3.12

Date: 04/21/2014 File name: LR0207ZZ.RES Page 15

Date: 04/21/2014 File name: LR0207ZZ.RES

```
"V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 11.97
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 SUBAREA AREA(ACRES) = 5.44
                             SUBAREA RUNOFF(CFS) = 9.47
                                                                           ______
 EFFECTIVE AREA(ACRES) = 11.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2015.00
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.81
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 2000.00
 TOTAL AREA (ACRES) = 11.1 PEAK FLOW RATE (CFS) =
                                                      19.64
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 664.99
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH (FEET) = 1.00
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.772
 DEPTH(FEET) = 0.52 FLOOD WIDTH(FEET) = 23.24
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 6.70 DEPTH*VELOCITY (FT*FT/SEC) = 3.50
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                               SCS
                                                                                LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            RESIDENTIAL
*******************
                                                                            "2 DWELLINGS/ACRE" B 5.92
                                                                                                                 0.75 0.700
                                                                                                                                56
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
                                                                            NATURAL FAIR COVER
______
                                                                            "OPEN BRUSH"
                                                                                                В
                                                                                                      5.87 0.61 1.000
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.849
_____
                                                                            TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 74.51
 TOTAL NUMBER OF STREAMS = 2
                                                                            TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.10
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                            AVERAGE FLOW DEPTH(FEET) = 0.77 FLOOD WIDTH(FEET) = 52.21
                                                                            "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 10.25
 TIME OF CONCENTRATION (MIN.) = 11.97
 RAINFALL INTENSITY (INCH/HR) = 2.53
                                                                            SUBAREA AREA(ACRES) = 11.79 SUBAREA RUNOFF(CFS) = 23.38
 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            EFFECTIVE AREA(ACRES) = 38.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.79
 AREA-AVERAGED Fp(INCH/HR) = 0.69
                                                                            TOTAL AREA (ACRES) = 43.0 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Ap = 0.81
                                                                                                                                 77.81
 EFFECTIVE STREAM AREA(ACRES) = 11.09
 TOTAL STREAM AREA(ACRES) = 11.09
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 19.64
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 ** CONFLUENCE DATA **
                                                                            END OF SUBAREA "V" GUTTER HYDRAULICS:
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                            DEPTH(FEET) = 0.78 FLOOD WIDTH(FEET) = 53.26
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            FLOW VELOCITY (FEET/SEC.) = 6.13 DEPTH*VELOCITY (FT*FT/SEC) = 4.76
    1
         44.86 8.43 3.117 0.72 (0.54) 0.75 19.3 20718.50
                                                                            LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20723.00 = 1827.20 FEET.
          43.19 9.40 2.919 0.72(0.54)0.75 20.2 20718.00
    1
                                                                           ******************
    2
          19.64 11.97 2.525 0.69(0.56) 0.81 11.1 20720.00
                                                                            FLOW PROCESS FROM NODE 20723.00 TO NODE 20724.00 IS CODE = 92
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                           ______
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                           _____
 ** PEAK FLOW RATE TABLE **
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2000.00
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 1960.00
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 2.00
          62.85 8.43 3.117 0.71 (0.54) 0.77 27.1 20718.50
   1
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
          61.71 9.40 2.919 0.71(0.54)0.77 28.9 20718.00
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
          55.69 11.97 2.525 0.70(0.55)0.77 31.2 20720.00
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH(FEET) = 1.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.772
 PEAK FLOW RATE (CFS) = 62.85 Tc (MIN.) = 8.43
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 EFFECTIVE AREA(ACRES) = 27.14 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fр
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 TOTAL AREA (ACRES) = 31.2
                                                                            NATURAL FAIR COVER
                                                                                               B 9.77 0.61 1.000
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            "OPEN BRUSH"
                                                                                                                               66
                                                                            RESIDENTIAL
*****************
                                                                            "5-7 DWELLINGS/ACRE" B 0.38 0.75 0.500
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20723.00 IS CODE = 92
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.981
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 17

Date: 04/21/2014 File name: LR0207ZZ.RES

```
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 155.65
 AVERAGE FLOW DEPTH(FEET) = 0.35 FLOOD WIDTH(FEET) = 3.00
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.00 Tc (MIN.) = 10.25
 SUBAREA AREA(ACRES) = 10.15
                              SUBAREA RUNOFF (CFS) = 19.79
 EFFECTIVE AREA(ACRES) = 49.08 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.83
 TOTAL AREA (ACRES) =
                   53.2
                              PEAK FLOW RATE(CFS) =
                                                       97.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
       NOTE: TRAVEL TIME ESTIMATES BASED ON NORMAL
       DEPTH EQUAL TO [GUTTER-HIKE + PAVEMENT LIP]
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.35 FLOOD WIDTH(FEET) = 3.00
 FLOW VELOCITY(FEET/SEC.) = 155.65 DEPTH*VELOCITY(FT*FT/SEC) = 54.48
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 1829.20 FEET.
FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
           97.60 10.25 2.772 0.68 (0.56) 0.83 49.1 20718.50
    1
    2
           94.24 11.24 2.623 0.68(0.56) 0.83 50.8 20718.00
           83.88 13.85 2.314 0.68 ( 0.56) 0.83
    3
                                             53.2 20720.00
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 1829.20 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
           81.69 22.88 1.712 0.68(0.49)0.73 74.5 20700.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
    1
          166.01 10.25 2.772 0.68 (0.53) 0.79 82.4 20718.50
          164.35 11.24 2.623 0.68(0.53)0.79
                                              87.4 20718.00
                                              98.3 20720.00
          157.74 13.85 2.314 0.68 (0.53) 0.78
    3
          136.75 22.88
                       1.712 0.68(0.52)0.77
                                             127.7 20700.00
   TOTAL AREA (ACRES) =
                        127.7
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 166.01 Tc (MIN.) = 10.248
 EFFECTIVE AREA(ACRES) = 82.44 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 127.7
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 12
```

```
>>>>CLEAR MEMORY BANK # 1 <<<<
_____
******************
FLOW PROCESS FROM NODE 20724.00 TO NODE 20725.00 IS CODE = 31
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1958.00
 FLOW LENGTH (FEET) = 81.40 MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.01
 ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 PIPE-FLOW(CFS) = 166.01
 PIPE TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 10.32
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20725.00 = 5374.33 FEET.
******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
***********************
 FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 15.1
______
>>>>DEFINE MEMORY BANK # 2 <<<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20658.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
       Q Tc Fp(Fm) Ap Ae HEADWATER
 NUMBER
         (CFS) (MIN.) (INCH/HR) (ACRES) NODE
  1
        549.44 14.82 0.74(0.43) 0.58 341.0 20649.00
        560.96 20.62 0.74(0.43) 0.58
                                446.6 20640.00
                                514.5 20600.00
        512.66 27.39 0.74(0.43) 0.58
        463.09 32.20 0.74(0.43) 0.58
                               534.2 20620.00
  TOTAL AREA(ACRES) =
                   534.2
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
******************
 FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 STREAM
          0
             Tc
                   Fp(Fm) Ap Ae HEADWATER
 NUMBER
         (CFS) (MIN.) (INCH/HR) (ACRES) NODE
  1
        549.44 14.82 0.74(0.43) 0.58
                               341.0 20649.00
        560.96 20.62 0.74(0.43) 0.58
                                446.6 20640.00
        512.66 27.39 0.74(0.43) 0.58
                                514.5 20600.00
        463.09 32.20 0.74(0.43) 0.58
                                534.2 20620.00
  TOTAL AREA(ACRES) =
                   534.2
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 19

Date: 04/21/2014 File name: LR0207ZZ.RES

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 1.11 HALFSTREET FLOOD WIDTH(FEET) = 48.35

FLOW VELOCITY (FEET/SEC.) = 11.81 DEPTH\*VELOCITY (FT\*FT/SEC.) = 13.08 \*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS: \*\* PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW \*\* ESTIMATED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1 ASSUME FULL-FLOWING PIPELINE PIPE-FLOW VELOCITY(FEET/SEC.) = 25.80PIPE-FLOW(CFS) = 507.11PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 21.23 \* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790 SUBAREA AREA (ACRES) = 20.46 SUBAREA RUNOFF (CFS) = 22.69 TOTAL AREA(ACRES) = 554.7 PEAK FLOW RATE (CFS) = 570.98SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01 STREETFLOW HYDRAULICS BASED ON MAINLINE To : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 63.87 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.56HALFSTREET FLOOD WIDTH (FEET) = 20.82 AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.79PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.78 \*\* PEAK FLOW RATE TABLE \*\* STREAM O Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER 1 562.83 15.43 2.169 0.73(0.44) 0.60 361.5 20649.00 570.98 21.23 1.790 0.73(0.43)0.59 467.1 20640.00 520.99 28.00 1.517 0.73(0.43)0.59 535.0 20600.00 471.63 32.73 1.381 0.73(0.44) 0.59 554.7 20620.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 570.98 Tc (MIN.) = 21.23 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.59 EFFECTIVE AREA(ACRES) = 467.10 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY \*\* MAIN STREAM CONFLUENCE DATA \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 1 562.83 15.43 2.169 0.73(0.44) 0.60 361.5 20649.00 2 570.98 21.23 1.790 0.73(0.43) 0.59 467.1 20640.00 520.99 28.00 1.517 0.73 (0.43) 0.59 535.0 20600.00 471.63 32.73 1.381 0.73(0.44) 0.59 554.7 20620.00 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.

Date: 04/21/2014

0

STREAM

NUMBER

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

File name: LR0207ZZ.RES

166.01 10.32 2.760 0.68(0.53) 0.79 82.4 20718.50

Tc Intensity Fp(Fm)

(CFS) (MIN.) (INCH/HR) (INCH/HR)

(ACRES) NODE

HEADWATER

Ap Ae

```
2
          164.35 11.31 2.612 0.68(0.53) 0.79
                                              87.4 20718.00
          157.74 13.92
                       2.306 0.68(0.53) 0.78
                                              98.3 20720.00
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
          136.75 22.96 1.709 0.68(0.52) 0.77 127.7 20700.00
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20725.00 = 5374.33 FEET.
                                                                           _____
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1958.00 DOWNSTREAM(FEET) = 1872.00
 ** PEAK FLOW RATE TABLE **
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 1421.01 CHANNEL SLOPE = 0.0605
                                                                            CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
  STREAM
           0
                Tc Intensity Fp(Fm)
                                      Ар Ае
                                                    HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00
    1
          671.34 10.32 2.760 0.72 (0.46) 0.65
                                              324.4 20718.50
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 717.07
    2
          682.90 11.31
                       2.612 0.72 ( 0.46) 0.64
                                               352.4 20718.00
                                                                            FLOW VELOCITY (FEET/SEC.) = 31.18 FLOW DEPTH (FEET) = 2.21
          706.11 13.92
                                               424.5 20720.00
                                                                            TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 33.49
    3
                       2.306 0.72(0.46) 0.64
                                                                            LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET.
          717.07 15.43
                       2.169 0.72(0.46) 0.64
                                              464.6 20649.00
          711.74 21.23
                       1.790 0.72(0.45) 0.63
                                              589.1 20640.00
                                                                           ******************
          694.99 22.96
                       1.709 0.72(0.45) 0.63
                                               612.0 20700.00
          635.62 28.00
                       1.517 0.72 ( 0.45) 0.63
                                               662.6 20600.00
                                                                             FLOW PROCESS FROM NODE 20726.00 TO NODE 20726.00 IS CODE = 81
          570.63 32.73
                       1.381 0.72(0.45) 0.63
                                                                           ______
                                               682.3 20620.00
   TOTAL AREA (ACRES) =
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                        682.3
                                                                           ______
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            MAINLINE Tc(MIN.) = 33.49
 PEAK FLOW RATE (CFS) = 717.07 Tc (MIN.) = 15.426
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.362
 EFFECTIVE AREA(ACRES) = 464.64 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.65
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fр
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TOTAL AREA (ACRES) = 682.3
                                                                                LAND USE
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
                                                                            RESIDENTIAL.
                                                                            "5-7 DWELLINGS/ACRE"
                                                                                                  В 3.96
                                                                                                                  0.75
                                                                                                                         0.500
                                                                                                                                56
*******************
                                                                            RESIDENTIAL
                                                                                                  B 4.31
                                                                                                                         0.700
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 71
                                                                            "2 DWELLINGS/ACRE"
                                                                                                                  0.75
                                                                                                                                56
_____
                                                                            NATURAL FAIR COVER
                                                                            "OPEN BRUSH"
                                                                                                                  0.61
                                                                                                                         1.000
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD <<< >
                                                                                                     14.46
                                                                                                                                66
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                       0.98
______
                                                                                                                 0.75
                                                                                                                         0.600
                                                                                                                                56
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845
 S-GRAPH: VALLEY(DEV.) = 77.8%; VALLEY(UNDEV.) / DESERT = 22.2%
                                                                            SUBAREA AREA (ACRES) = 23.71
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            UNIT-HYDROGRAPH DATA:
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.45; Ybar = 0.50
                                                                            RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            S-GRAPH: VALLEY(DEV.) = 76.5%; VALLEY(UNDEV.) / DESERT = 23.5%
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                            Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.46; Ybar = 0.50
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 682.3
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
                                                                            DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                            3HR = 1.00; 6HR = 1.00; 24HR = 1.00
  Lca/L=0.3, n=.0507; Lca/L=0.4, n=.0455; Lca/L=0.5, n=.0418; Lca/L=0.6, n=.0390
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 706.0
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 148.19
                                                                            LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET.
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 633.76
                                                                             EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 TOTAL PEAK FLOW RATE (CFS) = 633.76 (SOURCE FLOW INCLUDED)
                                                                             Lca/L=0.3,n=.0477; Lca/L=0.4,n=.0428; Lca/L=0.5,n=.0393; Lca/L=0.6,n=.0367
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 717.07
                                                                            TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 152.55
  (UPSTREAM NODE PEAK FLOW RATE(CFS) =
                                  717.07)
                                                                            UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 644.44
 PEAK FLOW RATE (CFS) USED = 717.07
                                                                            TOTAL AREA(ACRES) = 706.0
                                                                                                       PEAK FLOW RATE(CFS) =
                                                                                                                               717.07
                                                                            NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 12
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
_____
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 >>>>CLEAR MEMORY BANK # 1 <<<<<
                                                                           FLOW PROCESS FROM NODE 20726.00 TO NODE 20727.00 IS CODE = 54
******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20726.00 IS CODE = 54
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
      Date: 04/21/2014
                     File name: LR020777.RFS
                                                   Page 23
```

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1835.00 DOWNSTREAM(FEET) = 1820.00
                                                                                CHANNEL LENGTH THRU SUBAREA (FEET) = 832.56 CHANNEL SLOPE = 0.0180
 ELEVATION DATA: UPSTREAM(FEET) = 1872.00 DOWNSTREAM(FEET) = 1835.00
                                                                                CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 CHANNEL LENGTH THRU SUBAREA (FEET) = 760.88 CHANNEL SLOPE = 0.0486
                                                                                MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
                                                                                CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                              717.07
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00
                                                                                FLOW VELOCITY (FEET/SEC.) = 19.70 FLOW DEPTH (FEET) = 2.71
 CHANNEL FLOW THRU SUBAREA (CFS) = 717.07
                                                                                TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 34.64
 FLOW VELOCITY (FEET/SEC.) = 28.84 FLOW DEPTH (FEET) = 2.33
                                                                                LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET.
 TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 33.93
                                                                              *******************
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET.
                                                                                FLOW PROCESS FROM NODE 20728.00 TO NODE 20728.00 IS CODE = 81
*****************
 FLOW PROCESS FROM NODE 20727.00 TO NODE 20727.00 IS CODE = 81
                                                                                >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                              ______
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                MAINLINE Tc(MIN.) = 34.64
______
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.335
 MAINLINE Tc(MIN.) = 33.93
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.351
                                                                                DEVELOPMENT TYPE/
                                                                                                 SCS SOIL AREA
                                                                                                                      Fр
                                                                                                                               Αp
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                     Fρ
                                                                                RESIDENTIAL
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                "5-7 DWELLINGS/ACRE"
                                                                                                    в 3.88
                                                                                                                       0.75
                                                                                                                              0.500
     LAND USE
 RESIDENTIAL
                                                                                RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                             1.92
                                        0.75
                                                0.500
                                                      56
                                                                                "2 DWELLINGS/ACRE"
                                                                                                      B 12.91
                                                                                                                       0.75
                                                                                                                              0.700
 RESIDENTIAL
                                                                                RESIDENTIAL
 "2 DWELLINGS/ACRE"
                               6.30
                                        0.75
                                                0.700
                                                      56
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                       В
                                                                                                            6.79
                                                                                                                       0.75
                                                                                                                              0.600
                                                                                NATURAL FAIR COVER
 NATURAL FAIR COVER
                               12.35
                                        0.61
                                                                                                              2.42
 "OPEN BRUSH"
                                                1.000
                                                      66
                                                                                "OPEN BRUSH"
                                                                                                       В
                                                                                                                       0.61 1.000
 RESIDENTIAL
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 "3-4 DWELLINGS/ACRE" B
                             0.34
                                        0.75
                                              0.600
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                                SUBAREA AREA(ACRES) = 26.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
                                                                                UNIT-HYDROGRAPH DATA:
 SUBAREA AREA(ACRES) = 20.91
                                                                                RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
 UNIT-HYDROGRAPH DATA:
                                                                                S-GRAPH: VALLEY(DEV.) = 76.0%; VALLEY(UNDEV.)/DESERT= 24.0%
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
                                                                                       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 S-GRAPH: VALLEY (DEV.) = 75.4%; VALLEY (UNDEV.) / DESERT= 24.6%
                                                                                Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.46; Ybar = 0.51
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 Tc(HR) = 0.57; LAG(HR) = 0.45; Fm(INCH/HR) = 0.46; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                                LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET.
                                                                                EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 726.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET.
                                                                                Lca/L=0.3, n=.0441; Lca/L=0.4, n=.0396; Lca/L=0.5, n=.0364; Lca/L=0.6, n=.0339
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 161.67
  Lca/L=0.3,n=.0460; Lca/L=0.4,n=.0413; Lca/L=0.5,n=.0379; Lca/L=0.6,n=.0354
                                                                                UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 668.67
                                                                                                               PEAK FLOW RATE (CFS) = 717.07
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 156.30
                                                                                TOTAL AREA (ACRES) = 752.9
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                    655.18
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 TOTAL AREA(ACRES) = 726.9
                              PEAK FLOW RATE(CFS) = 717.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              *******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                FLOW PROCESS FROM NODE 20728.00 TO NODE 20748.00 IS CODE = 54
*****************
                                                                              ______
 FLOW PROCESS FROM NODE 20727.00 TO NODE 20728.00 IS CODE = 54
                                                                                >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                                >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                              ______
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1820.00 DOWNSTREAM(FEET) = 1815.00
                                                                                CHANNEL LENGTH THRU SUBAREA (FEET) = 259.80 CHANNEL SLOPE = 0.0192
```

Page 25

Date: 04/21/2014

File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR020777.RFS Page 26

SCS

56

56

56

```
CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 717.07
 FLOW VELOCITY (FEET/SEC.) = 20.18 FLOW DEPTH (FEET) = 2.67
 TRAVEL TIME (MIN.) = 0.21 Tc (MIN.) = 34.85
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
******************
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 34.85
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                              Ар
                                                      SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.70
                                     0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA (ACRES) = 0.70
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
 S-GRAPH: VALLEY(DEV.) = 76.0%; VALLEY(UNDEV.) / DESERT = 24.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.46; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 753.6
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0436; Lca/L=0.4,n=.0391; Lca/L=0.5,n=.0359; Lca/L=0.6,n=.0335
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 161.85
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 666.33
 TOTAL AREA (ACRES) = 753.6
                             PEAK FLOW RATE (CFS) = 717.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
********************
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 717.07 Tc (MIN.) = 34.85
 AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.51
 TOTAL AREA (ACRES) =
******************
 FLOW PROCESS FROM NODE 20730.00 TO NODE 20731.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
INITIAL SUBAREA FLOW-LENGTH (FEET) = 428.13
 ELEVATION DATA: UPSTREAM(FEET) = 1955.00 DOWNSTREAM(FEET) = 1935.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.104
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.191
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    B 1.49 0.61 1.000
                                                  66 14.71
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 2.96 0.75 0.500
                                                  56 8.10
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.667
 SUBAREA RUNOFF(CFS) = 10.96
 TOTAL AREA (ACRES) = 4.45 PEAK FLOW RATE (CFS) = 10.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20731.00 TO NODE 20732.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 975.64 CHANNEL SLOPE = 0.0461
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 10.96
 FLOW VELOCITY (FEET/SEC.) = 8.98 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 9.91
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20732.00 = 1403.77 FEET.
FLOW PROCESS FROM NODE 20732.00 TO NODE 20732.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 9.91
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.828
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В 5.96
                                    0.61 1.000
                                                  66
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.56
                                    0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.759
 SUBAREA AREA (ACRES) = 11.52 SUBAREA RUNOFF (CFS) = 24.15
 EFFECTIVE AREA(ACRES) = 15.97 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 16.0
                             PEAK FLOW RATE (CFS) =
                                                  33.66
```

File name: LR0207ZZ.RES

Page 28

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
********************
 FLOW PROCESS FROM NODE 20732.00 TO NODE 20733.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1845.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 862.28 CHANNEL SLOPE = 0.0522
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             33.66
 FLOW VELOCITY (FEET/SEC.) = 13.20 FLOW DEPTH (FEET) = 0.61
 TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 11.00
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20733.00 = 2266.05 FEET.
*******************
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20733.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 11.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.656
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fρ
                                              Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                             0.59
                                      0.75
                                             0.700
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              7.70
                                      0.61
                                             1.000
                                                   66
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                              5.46
                                      0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.789
 SUBAREA AREA (ACRES) = 13.75
                             SUBAREA RUNOFF (CFS) = 26.50
 EFFECTIVE AREA(ACRES) = 29.72 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.76
                   29.7 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                                                     57.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*****
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20748.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1845.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 848.95 CHANNEL SLOPE = 0.0353
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              57.69
 FLOW VELOCITY (FEET/SEC.) = 13.45 FLOW DEPTH (FEET) = 0.90
 TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 12.05
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20748.00 = 3115.00 FEET.
```

\* FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 12.05\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.515 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "2 DWELLINGS/ACRE" 41.76 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.84 0.75 0.600 56 RESIDENTIAL "5-7 DWELLINGS/ACRE" 4.95 0.75 0.500 56 NATURAL FAIR COVER "OPEN BRUSH" 17.32 0.61 1.000 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764 SUBAREA AREA(ACRES) = 64.87 SUBAREA RUNOFF (CFS) = 115.55EFFECTIVE AREA(ACRES) = 94.59 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.76 TOTAL AREA (ACRES) = 94.6 PEAK FLOW RATE(CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01\* FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<< \_\_\_\_\_ TOTAL NUMBER OF STREAMS = 3 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 12.05 RAINFALL INTENSITY (INCH/HR) = 2.51AREA-AVERAGED Fm(INCH/HR) = 0.52AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.76EFFECTIVE STREAM AREA(ACRES) = 94.59 TOTAL STREAM AREA (ACRES) = 94.59 PEAK FLOW RATE (CFS) AT CONFLUENCE = 169.46 \* FLOW PROCESS FROM NODE 20740.00 TO NODE 20741.00 IS CODE = 21 ...... >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.40 ELEVATION DATA: UPSTREAM(FEET) = 2095.00 DOWNSTREAM(FEET) = 2070.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.865 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.539 SUBAREA TC AND LOSS RATE DATA (AMC II):

File name: LR020777.RFS

Page 30

Date: 04/21/2014

```
DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                    Fр
                                                  SCS Tc
                                            Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           7.73
                                  0.75 0.700 56 11.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 14.02
 TOTAL AREA (ACRES) =
                  7.73 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*****
 FLOW PROCESS FROM NODE 20741.00 TO NODE 20742.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2070.00 DOWNSTREAM(FEET) = 2035.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 418.24 CHANNEL SLOPE = 0.0837
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             14.02
 FLOW VELOCITY (FEET/SEC.) = 5.67 FLOW DEPTH (FEET) = 0.99
 TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 13.09
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20742.00 = 1132.64 FEET.
******************
 FLOW PROCESS FROM NODE 20742.00 TO NODE 20742.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 13.09
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.393
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             4.91
                                    0.75
                                         0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 4.91
                            SUBAREA RUNOFF (CFS) = 8.26
 EFFECTIVE AREA(ACRES) = 12.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.6
                            PEAK FLOW RATE(CFS) =
                                                  21.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20742.00 TO NODE 20743.00 IS CODE = 54
._____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2020.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 525.35 CHANNEL SLOPE = 0.0286
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
```

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 4.24 FLOW DEPTH (FEET) = 1.42
 TRAVEL TIME (MIN.) = 2.06 Tc (MIN.) = 15.16
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20743.00 = 1657.99 FEET.
*******************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20743.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 15.16
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.192
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                          Αр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                          7.69 0.75 0.700
                   В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 7.69
                           SUBAREA RUNOFF(CFS) = 11.54
 EFFECTIVE AREA(ACRES) = 20.33 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 20.3 PEAK FLOW RATE(CFS) =
                                                 30.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*******************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20744.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 1970.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.30 CHANNEL SLOPE = 0.1007
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             30.52
 FLOW VELOCITY (FEET/SEC.) = 7.40 FLOW DEPTH (FEET) = 1.28
 TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 16.28
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20744.00 = 2154.29 FEET.
******************
 FLOW PROCESS FROM NODE 20744.00 TO NODE 20744.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 16.28
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.100
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                Fρ
                                                SCS
                                          Αр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 6.02 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 6.02 SUBAREA RUNOFF (CFS) = 8.54
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 31

File name: LR0207ZZ.RES

Date: 04/21/2014

```
26.35 AREA-AVERAGED Fm(INCH/HR) = 0.52
 EFFECTIVE AREA(ACRES) =
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 26.4 PEAK FLOW RATE(CFS) =
                                                    37.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20744.00 TO NODE 20745.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1920.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.30 CHANNEL SLOPE = 0.0978
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               37.38
 FLOW VELOCITY (FEET/SEC.) = 7.72 FLOW DEPTH (FEET) = 1.39
 TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 17.38
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20745.00 = 2665.59 FEET.
*******************
 FLOW PROCESS FROM NODE 20745.00 TO NODE 20745.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 17.38
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.019
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                              6.61
                                      0.75
                                             0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 0.17 0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
 SUBAREA AREA(ACRES) = 6.78
                             SUBAREA RUNOFF (CFS) = 9.14
 EFFECTIVE AREA(ACRES) = 33.13 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 33.1
                             PEAK FLOW RATE(CFS) =
                                                     44.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20745.00 TO NODE 20746.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1920.00 DOWNSTREAM(FEET) = 1895.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 558.91 CHANNEL SLOPE = 0.0447
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              44.60
 FLOW VELOCITY (FEET/SEC.) = 3.97 FLOW DEPTH (FEET) = 0.86
```

```
TRAVEL TIME (MIN.) = 2.34 Tc (MIN.) = 19.72
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20746.00 = 3224.50 FEET.
FLOW PROCESS FROM NODE 20746.00 TO NODE 20746.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 19.72
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.871
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.76
                                     0.75
                                            0.600
                                                   56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           8.95 0.75 0.700
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA AREA (ACRES) = 9.71
                            SUBAREA RUNOFF (CFS) = 11.83
 EFFECTIVE AREA(ACRES) = 42.84 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 42.8
                              PEAK FLOW RATE(CFS) =
                                                   52.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20746.00 TO NODE 20747.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1895.00 DOWNSTREAM(FEET) = 1840.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 573.14 CHANNEL SLOPE = 0.0960
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 52.03
 FLOW VELOCITY (FEET/SEC.) = 5.55 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 21.45
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20747.00 = 3797.64 FEET.
***********************
 FLOW PROCESS FROM NODE 20747.00 TO NODE 20747.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 21.45
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.780
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.57 0.75
                                            0.600
                                                   56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           9.61
                                     0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
```

File name: LR020777.RFS

Page 34

Date: 04/21/2014

```
SUBAREA AREA(ACRES) = 10.18
                             SUBAREA RUNOFF(CFS) = 11.55
                                                                           TIME OF CONCENTRATION (MIN.) = 24.70
 EFFECTIVE AREA(ACRES) = 53.02 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           RAINFALL INTENSITY (INCH/HR) = 1.64
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.52
 TOTAL AREA(ACRES) = 53.0
                            PEAK FLOW RATE(CFS) =
                                                    60.04
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                           AREA-AVERAGED Ap = 0.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           EFFECTIVE STREAM AREA(ACRES) = 65.73
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                           TOTAL STREAM AREA (ACRES) = 65.73
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE =
******************
                                                                           ** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 20747.00 TO NODE 20748.00 IS CODE = 54
                                                                           STREAM
                                                                                  0
                                                                                          Tc
                                                                                                AREA
                                                                                                          HEADWATER
                                                                           NUMBER (CFS) (MIN.) (ACRES)
                                                                                                         NODE
                                                                            1
                                                                                  717.07 34.85 753.64 20620.00
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                            2 169.46 12.05 94.59 20730.00
_____
                                                                                   66.08 24.70 65.73 20740.00
                                                                             3
 ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 752.37 CHANNEL SLOPE = 0.0332
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                           UNIT-HYDROGRAPH DATA:
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.94
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                           S-GRAPH: VALLEY(DEV.) = 76.6%; VALLEY(UNDEV.) / DESERT = 23.4%
                             60.04
 FLOW VELOCITY (FEET/SEC.) = 3.85 FLOW DEPTH (FEET) = 1.02
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 TRAVEL TIME (MIN.) = 3.26 Tc (MIN.) = 24.70
                                                                           Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.47; Ybar = 0.52
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20748.00 = 4550.01 FEET.
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                           DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
************************
                                                                           3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 914.0
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           EOUIVALENT BASIN FACTOR APPROXIMATIONS:
_____
                                                                           Lca/L=0.3,n=.0436; Lca/L=0.4,n=.0391; Lca/L=0.5,n=.0359; Lca/L=0.6,n=.0335
 MAINLINE Tc(MIN.) = 24.70
                                                                           TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 192.98
                                                                           PEAK FLOW RATE(CFS) = 794.85
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.635
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         *******************
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fp
                                           Ар
                                                                           FLOW PROCESS FROM NODE 20748.00 TO NODE 20749.00 IS CODE = 54
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                         ______
 "2 DWELLINGS/ACRE"
                     В
                           8.54
                                     0.75
                                             0.700
                                                  56
                                                                           >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 RESIDENTIAL
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 "3-4 DWELLINGS/ACRE"
                      B 2.23
                                     0.75
                                             0.600
                                                   56
                                                                         ______
 PUBLIC PARK
                             0.78
                                     0.75
                                             0.850
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1815.00 DOWNSTREAM(FEET) = 1700.00
 RESIDENTIAL
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 2764.03 CHANNEL SLOPE = 0.0416
 "5-7 DWELLINGS/ACRE"
                   B 1.16
                                     0.75 0.500 56
                                                                           CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
                                                                           CHANNEL FLOW THRU SUBAREA (CFS) = 794.85
 SUBAREA AREA(ACRES) = 12.71 SUBAREA RUNOFF(CFS) = 12.94
                                                                           FLOW VELOCITY (FEET/SEC.) = 27.44 FLOW DEPTH (FEET) = 2.30
 EFFECTIVE AREA(ACRES) = 65.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 36.53
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14662.13 FEET.
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 65.7 PEAK FLOW RATE (CFS) =
                                                    66.08
                                                                         ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           FLOW PROCESS FROM NODE 20749.00 TO NODE 20749.00 IS CODE = 81
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
******************
                                                                         ______
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
                                                                           MAINLINE Tc(MIN.) = 36.53
______
                                                                           * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.293
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
                                                                                                                       αA
                                                                                                                             SCS
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
______
                                                                              LAND USE
 TOTAL NUMBER OF STREAMS = 3
                                                                           RESIDENTIAL
                                                                           "2 DWELLINGS/ACRE" B
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
                                                                                                      46.16
                                                                                                               0.75
                                                                                                                      0.700
      Date: 04/21/2014
                     File name: LR0207ZZ.RES
                                                                                Date: 04/21/2014 File name: LR0207ZZ.RES
                                                                                                                            Page 36
                                                  Page 35
```

RESIDENTIAL "3-4 DWELLINGS/ACRE" B 9.13 0.75 0.600 56	"2 DWELLINGS/ACRE" B 51.53 0.75 0.700 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.637
"5-7 DWELLINGS/ACRE" B 13.04 0.75 0.500 56	SUBAREA AREA (ACRES) = 81.75
PUBLIC PARK B 14.63 0.75 0.850 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.95
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684	S-GRAPH: VALLEY(DEV.) = 80.2%; VALLEY(UNDEV.) / DESERT = 19.8%
SUBAREA AREA (ACRES) = 82.96	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
UNIT-HYDROGRAPH DATA:	Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.47; Ybar = 0.52
RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.95	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
S-GRAPH: VALLEY (DEV.) = 78.6%; VALLEY (UNDEV.) / DESERT= 21.4%	DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%	3HR = 0.99; 6HR = 1.00; 24HR= 1.00
Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.47; Ybar = 0.52	UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1078.7
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.	LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;	EQUIVALENT BASIN FACTOR APPROXIMATIONS:
3HR = 0.99; 6HR = 1.00; 24HR= 1.00	Lca/L=0.3,n=.0359; Lca/L=0.4,n=.0322; Lca/L=0.5,n=.0295; Lca/L=0.6,n=.0276
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 996.9	TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 226.58
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14662.13 FEET.	UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 864.61
EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0394; Lca/L=0.4,n=.0353; Lca/L=0.5,n=.0325;Lca/L=0.6,n=.0303	TOTAL AREA (ACRES) = 1078.7 PEAK FLOW RATE (CFS) = 864.61
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 209.35	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 822.90	5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
TOTAL AREA (ACRES) = 996.9 PEAK FLOW RATE (CFS) = 822.90	011 0100, 0011 0170, 1111. 0170, 0111. 2101, 0111. 2123, 21111. 0101
	****************
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 1
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01	
	>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
****************	
FLOW PROCESS FROM NODE 20749.00 TO NODE 20763.00 IS CODE = 54	TOTAL NUMBER OF STREAMS = 2
	CONFILENCE VALUE GRED FOR INDEPENDENT CERRAN 1 ARE.
>>>>COMPLITE TRADEZOTDAL CHANNEL FLOW<	CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <><< ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 TC(MIN.) = 38.63	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 TC(MIN.) = 38.63	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)< ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE(CFS) = 864.61 Tc(MIN.) = 38.63  AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA(ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<=================================	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63  AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <><<	PEAK FLOW RATE (CFS) = 864.61
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <><<  ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA (CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 Tc(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.  **********************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED FM (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<>>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY (FEET/SEC.) = 25.11 FLOW DEPTH (FEET) = 2.51 TRAVEL TIME (MIN.) = 2.10 Tc (MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.  **********************************	PEAK FLOW RATE (CFS) = 864.61 Tc(MIN.) = 38.63  AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.52  TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 TC(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7  **********************************
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<< >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1600.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 3167.14 CHANNEL SLOPE = 0.0316 CHANNEL BASE(FEET) = 8.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00 CHANNEL FLOW THRU SUBAREA(CFS) = 822.90 FLOW VELOCITY(FEET/SEC.) = 25.11 FLOW DEPTH(FEET) = 2.51 TRAVEL TIME(MIN.) = 2.10 TC(MIN.) = 38.63 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.   ************************************	PEAK FLOW RATE (CFS) = 864.61 Tc (MIN.) = 38.63 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52 TOTAL AREA (ACRES) = 1078.7  **********************************

 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 37
 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 38

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 FLOW PROCESS FROM NODE 20751.00 TO NODE 20752.00 IS CODE = 54
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                               STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                               STREET FLOW DEPTH (FEET) = 0.44
HALFSTREET FLOOD WIDTH (FEET) = 15.93
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2120.00
                                                                               AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
 CHANNEL LENGTH THRU SUBAREA (FEET) = 482.67 CHANNEL SLOPE = 0.0622
                                                                               PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.43
 CHANNEL BASE (FEET) = 482.67 "Z" FACTOR = 2.500
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 22.72
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                             * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.719
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                             SUBAREA LOSS RATE DATA (AMC II):
                              15.18
 FLOW VELOCITY (FEET/SEC.) = 0.89 FLOW DEPTH (FEET) = 0.04
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fр
 TRAVEL TIME (MIN.) = 9.03 Tc (MIN.) = 21.47
                                                                                 LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20752.00 = 1392.76 FEET.
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" B 3.61 0.75 0.600
*******************
                                                                             RESIDENTIAL
                                                                                                 B 21.76 0.75 0.700 56
 FLOW PROCESS FROM NODE 20752.00 TO NODE 20752.00 IS CODE = 81
                                                                             "2 DWELLINGS/ACRE"
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
_____
                                                                             SUBAREA AREA (ACRES) = 25.37 SUBAREA RUNOFF (CFS) = 27.55
                                                                             EFFECTIVE AREA(ACRES) = 38.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
 MAINLINE Tc (MIN.) = 21.47
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.779
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                             TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) = 41.84
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                             Дp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.44
                                    0.75
                                              0.600 56
                                                                             END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                                                                             DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 "2 DWELLINGS/ACRE"
                     B 4.07 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             FLOW VELOCITY (FEET/SEC.) = 6.01 DEPTH*VELOCITY (FT*FT/SEC.) = 2.96
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                                                                             *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA(ACRES) = 4.51
                             SUBAREA RUNOFF(CFS) = 5.12
                                                                                   AND L = 408.2 FT WITH ELEVATION-DROP = 20.0 FT, IS 59.9 CFS,
 EFFECTIVE AREA(ACRES) = 13.09 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                   WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20753.00
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                             LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20753.00 = 1800.93 FEET.
 TOTAL AREA(ACRES) = 13.1
                             PEAK FLOW RATE(CFS) = 15.18
                                                                            ******************
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                             FLOW PROCESS FROM NODE 20753.00 TO NODE 20754.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            ______
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                            ______
 FLOW PROCESS FROM NODE 20752.00 TO NODE 20753.00 IS CODE = 63
                                                                             UPSTREAM ELEVATION(FEET) = 2100.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
                                                                             STREET LENGTH (FEET) = 602.59 CURB HEIGHT (INCHES) = 6.0
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 408.17 CURB HEIGHT (INCHES) = 6.0
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

Page 39

Date: 04/21/2014

File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR020777.RFS Page 40

28.96

SCS

56

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.70
                                                  47.97
   ***STREET FLOWING FULL***
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 26.10
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.582
  STREET FLOW DEPTH(FEET) = 0.49
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                           Fρ
                                                                                                                                    Αp
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.94
                                                                                       LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.41
                                                                                   RESIDENTIAL
                                                                                   "2 DWELLINGS/ACRE" B 31.15
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 24.16
                                                                                                                            0.75
                                                                                                                                    0.700
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.657
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE"
                                                                                                       B 6.15 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                         B 3.45 0.75 0.600 56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp Ap SCS
                                                                                   SCHOOL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
 RESIDENTIAL
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.676
 "2 DWELLINGS/ACRE"
                      в 9.79
                                                                                   SUBAREA AREA (ACRES) = 40.75 SUBAREA RUNOFF (CFS) = 39.46
                                         0.75
                                                 0.700 56
 RESIDENTIAL
                                                                                   EFFECTIVE AREA(ACRES) = 91.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 "3-4 DWELLINGS/ACRE"
                     B 1.89
                                         0.75
                                                 0.600 56
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 SCHOOL
                                0.21
                                                 0.600
                                                                                   TOTAL AREA (ACRES) = 91.1 PEAK FLOW RATE (CFS) = 88.00
                        В
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 11.89
                                SUBAREA RUNOFF(CFS) = 12.27
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 EFFECTIVE AREA(ACRES) = 50.35 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.52
 TOTAL AREA(ACRES) = 50.3
                                PEAK FLOW RATE(CFS) =
                                                          51.94
                                                                                   FLOW VELOCITY (FEET/SEC.) = 6.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                         AND L = 704.6 FT WITH ELEVATION-DROP = 20.0 FT, IS 75.9 CFS,
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20755.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20755.00 = 3108.10 FEET.
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.07
                                                                                  *******************
 FLOW VELOCITY (FEET/SEC.) = 7.15 DEPTH*VELOCITY (FT*FT/SEC.) = 3.58
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20754.00 = 2403.52 FEET.
                                                                                   FLOW PROCESS FROM NODE 20755.00 TO NODE 20756.00 IS CODE = 63
*******************
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20754.00 TO NODE 20755.00 IS CODE = 63
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 ______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   STREET LENGTH (FEET) = 785.85 CURB HEIGHT (INCHES) = 6.0
_____
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 704.58 CURB HEIGHT (INCHES) = 6.0
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
                                                                                     ***STREET FLOWING FULL***
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.67
                                                                                     STREET FLOW DEPTH (FEET) = 0.61
   ***STREET FLOWING FULL***
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 23.32
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.04
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.88
   STREET FLOW DEPTH (FEET) = 0.61
  HALFSTREET FLOOD WIDTH (FEET) = 23.57
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 27.73
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.05
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.525
```

Date: 04/21/2014 File name: LR0207ZZ.RES Page 41 Date: 04/21/2014 File name: LR0207ZZ.RES

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
                                        Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AREA(ACRES) = 10.69 SUBAREA RUNOFF(CFS) = 9.28
                                                                                 EFFECTIVE AREA(ACRES) = 113.48 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В 9.12
                                        0.75
                                                 0.700
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                 TOTAL AREA (ACRES) = 113.5 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.57 0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 10.71
 EFFECTIVE AREA(ACRES) = 102.79 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 23.14
 TOTAL AREA(ACRES) = 102.8 PEAK FLOW RATE(CFS) =
                                                                                 FLOW VELOCITY (FEET/SEC.) = 8.62 DEPTH*VELOCITY (FT*FT/SEC.) = 5.20
                                                                                 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20757.00 = 4734.62 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                *****************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                                 FLOW PROCESS FROM NODE 20757.00 TO NODE 20758.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.44
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 8.02 DEPTH*VELOCITY (FT*FT/SEC.) = 4.89
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20756.00 = 3893.95 FEET.
                                                                                ______
                                                                                 UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1920.00
STREET LENGTH (FEET) = 946.77 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20756.00 TO NODE 20757.00 IS CODE = 63
                                                                                 STREET HALFWIDTH (FEET) = 18.00
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  INSIDE STREET CROSSFALL (DECIMAL) = 0.020
_____
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2000.00 DOWNSTREAM ELEVATION(FEET) = 1950.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 840.67 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 123.99
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH(FEET) = 0.71
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 28.51
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.67
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.30
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.18
                                                98.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 2.16 Tc (MIN.) = 31.52
   ***STREET FLOWING FULL***
                                                                                  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.413
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.60
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                                                 Αp
                                                                                     LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 23.14
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.63
                                                                                 RESIDENTIAL
                                                                                 "2 DWELLINGS/ACRE" B 50.96 0.75 0.700
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.20
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 29.36
                                                                                 RESIDENTIAL.
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.474
                                                                                  "3-4 DWELLINGS/ACRE" B 11.45 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AREA (ACRES) = 62.41 SUBAREA RUNOFF (CFS) = 50.71
     LAND USE
                                                                                 EFFECTIVE AREA(ACRES) = 175.89 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.65
                                         0.75
                                                 0.700
                                                       56
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
                                                                                 TOTAL AREA (ACRES) = 175.9 PEAK FLOW RATE (CFS) = 143.05
 "3-4 DWELLINGS/ACRE" B
                                2.04
                                         0.75
                                                 0.600
```

Date: 04/21/2014

File name: LR0207ZZ.RES Page 43 Date: 04/21/2014 File name: LR0207ZZ.RES Page 44

98.63

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.74 HALFSTREET FLOOD WIDTH (FEET) = 30.16
 FLOW VELOCITY (FEET/SEC.) = 7.56 DEPTH*VELOCITY (FT*FT/SEC.) = 5.62
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 946.8 FT WITH ELEVATION-DROP = 30.0 FT, IS 108.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20758.00
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20758.00 = 5681.39 FEET.
******************
 FLOW PROCESS FROM NODE 20758.00 TO NODE 20759.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1920.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 1200.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 151.26
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 29.79
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.02
 STREET FLOW TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 33.96
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.351
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                 0.700
 "2 DWELLINGS/ACRE"
                      В 18.41
                                         0.75
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.34 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
 SUBAREA AREA(ACRES) = 21.75 SUBAREA RUNOFF(CFS) = 16.42
 EFFECTIVE AREA(ACRES) = 197.64 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 197.6 PEAK FLOW RATE (CFS) = 149.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.67
 FLOW VELOCITY (FEET/SEC.) = 8.16 DEPTH*VELOCITY (FT*FT/SEC.) = 5.99
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20759.00 = 6881.42 FEET.
******************
 FLOW PROCESS FROM NODE 20759.00 TO NODE 20760.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1875.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1845.00
 FLOW LENGTH (FEET) = 1440.55 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 27.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.08
 PIPE-FLOW(CFS) = 149.67
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 35.29
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20760.00 = 8321.97 FEET.
FLOW PROCESS FROM NODE 20760.00 TO NODE 20760.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 35.29
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.320
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 47.33 0.75
                                            0.700
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 8.18
                                     0.75 0.600
                                                   56
                            1.84
                                     0.75 0.850 56
 PUBLIC PARK
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA(ACRES) = 57.35
                          SUBAREA RUNOFF(CFS) = 41.47
 EFFECTIVE AREA(ACRES) = 254.99 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 255.0 PEAK FLOW RATE (CFS) = 185.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
******************
 FLOW PROCESS FROM NODE 20760.00 TO NODE 20761.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1845.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1770.00
 FLOW LENGTH (FEET) = 1840.39 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 46

```
DEPTH OF FLOW IN 57.0 INCH PIPE IS 25.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.51
 PIPE-FLOW(CFS) = 185.67
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 36.54
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20761.00 = 10162.36 FEET.
*******************
 FLOW PROCESS FROM NODE 20761.00 TO NODE 20761.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE TC (MIN.) = 36.54
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.293
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            qД
                                                    SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В 56.58
                                      0.75
                                              0.700
                                                     56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.66
                                      0.75
                                            0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 69.24
                             SUBAREA RUNOFF (CFS) = 48.78
 EFFECTIVE AREA(ACRES) = 324.23 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                 324.2
 TOTAL AREA (ACRES) =
                             PEAK FLOW RATE(CFS) =
                                                    228.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
*****************
 FLOW PROCESS FROM NODE 20761.00 TO NODE 20762.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1770.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1740.00
 FLOW LENGTH (FEET) = 1572.80 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.40
 PIPE-FLOW(CFS) = 228.18
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 37.98
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.263
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
                                      Fρ
                                              Aρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            7.27
                                      0.75
                                              0.600
                                                    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                             33.52
                                      0.75
                                              0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 40.79
                             SUBAREA RUNOFF (CFS) = 27.64
```

File name: LR0207ZZ.RES

Page 47

Date: 04/21/2014

```
EFFECTIVE AREA(ACRES) = 365.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 365.0 PEAK FLOW RATE(CFS) =
                                                        247.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 18.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 16.01
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.65
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20762.00 = 11735.16 FEET.
******************
 FLOW PROCESS FROM NODE 20762.00 TO NODE 20763.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1740.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1727.01 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 23.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 33.97
 PIPE-FLOW(CFS) = 247.17
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 38.83
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20763.00 = 13462.17 FEET.
******************
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 38.83
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.246
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                        SCS
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      В
                            19.08
                                         0.75
                                                0.500
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              133.50
                                         0.75
                                                0.700
       Date: 04/21/2014
                       File name: LR0207ZZ.RES
                                                      Page 48
```

```
RESTDENTIAL
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1510.00
 "3-4 DWELLINGS/ACRE" B 16.16
                                      0.75
                                             0.600 56
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 3292.21 CHANNEL SLOPE = 0.0273
 COMMERCIAL
                     B 11.70 0.75 0.100 56
                                                                            CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MOBILE HOME PARK
                     В
                            5.20 0.75 0.250 56
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 1285.32
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
                                                                            FLOW VELOCITY (FEET/SEC.) = 26.55 FLOW DEPTH (FEET) = 3.02
                                                                            TRAVEL TIME (MIN.) = 2.07 Tc (MIN.) = 40.70
 SUBAREA AREA(ACRES) = 185.64
                           SUBAREA RUNOFF (CFS) = 130.73
 EFFECTIVE AREA(ACRES) = 550.66 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                            LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
                                                                          *******************
 TOTAL AREA (ACRES) = 550.7 PEAK FLOW RATE (CFS) = 372.44
                                                                            FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          ______
******************
                                                                            MAINLINE Tc (MIN.) = 40.70
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 1
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.212
______
                                                                            SUBAREA LOSS RATE DATA(AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                                                              Fp Ap
                                                                                                                               SCS
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B 27.93
                                                                                                                 0.75
                                                                                                                        0.600
                                                                                                                                56
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                            MOBILE HOME PARK
                                                                                               в 2.86 0.75
                                                                                                                        0.250
                                                                                                                                56
 TIME OF CONCENTRATION (MIN.) = 38.83
                                                                            RESIDENTIAL
                                                                            "2 DWELLINGS/ACRE"
                                                                                               В 36.04
                                                                                                                 0.75 0.700
                                                                                                                                56
 RAINFALL INTENSITY (INCH/HR) = 1.25
 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                            PUBLIC PARK
                                                                                                В
                                                                                                       0.07 0.75 0.850
                                                                                                                                56
                                                                                                       0.16
                                                                                                                                56
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                            COMMERCIAL
                                                                                                  В
                                                                                                              0.75
                                                                                                                        0.100
 AREA-AVERAGED Ap = 0.66
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 550.66
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.638
 TOTAL STREAM AREA(ACRES) = 550.66
                                                                            SUBAREA AREA (ACRES) = 67.06
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 372.44
                                                                            UNIT-HYDROGRAPH DATA:
 ** CONFLUENCE DATA **
                                                                            RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.65;6H= 2.30;24H= 4.98
                     AREA
 STREAM
         O Tc
                                HEADWATER
                                                                            S-GRAPH: VALLEY (DEV.) = 87.4%; VALLEY (UNDEV.) / DESERT= 12.6%
 NUMBER (CFS) (MIN.) (ACRES)
                                NODE
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
   1 864.61 38.63 1078.67 20620.00
                                                                            Tc(HR) = 0.68; LAG(HR) = 0.54; Fm(INCH/HR) = 0.48; Ybar = 0.53
         372.44 38.83 550.66 20750.00
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-HYDROGRAPH DATA:
                                                                            UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1696.4
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.65;6H= 2.30;24H= 4.98
                                                                            LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
 S-GRAPH: VALLEY(DEV.) = 86.9%; VALLEY(UNDEV.) / DESERT= 13.1%
                                                                            EQUIVALENT BASIN FACTOR APPROXIMATIONS:
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                            Lca/L=0.3, n=.0331; Lca/L=0.4, n=.0296; Lca/L=0.5, n=.0272; Lca/L=0.6, n=.0254
 Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.48; Ybar = 0.53
                                                                            TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 353.32
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1299.02
 DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;
                                                                            TOTAL AREA (ACRES) = 1696.4 PEAK FLOW RATE (CFS) = 1299.02
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1629.3
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                           Lca/L=0.3,n=.0359; Lca/L=0.4,n=.0322; Lca/L=0.5,n=.0295; Lca/L=0.6,n=.0276
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 339.35
                                                                            FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 152
 PEAK FLOW RATE (CFS) = 1285.32
                                                                                  ______
                                                                            >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
*****************
                                                                          ______
 FLOW PROCESS FROM NODE 20763.00 TO NODE 20764.00 IS CODE = 54
                                                                            PEAK FLOWRATE TABLE FILE NAME: 20764.DNA
                                                                           ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            END OF STUDY SUMMARY:
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                            TOTAL AREA (ACRES) = 1696.4 TC (MIN.) = 40.70
                                                                            AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.53
```

Page 49

Date: 04/21/2014 File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 50

PEAK	FLOW	RATE	CFS	) =	1299.0	2

\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 51
 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 52

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

^

+ DELITARD DISTRIBUTE INCHES

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20852

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*

FILE NAME: LR0208ZZ.DAT

TIME/DATE OF STUDY: 08:04 11/19/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGY AND HIDRAULIC MODEL INFORMATION.

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.00 TO NODE 20800.50 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 706.90 ELEVATION DATA: UPSTREAM(FEET) = 2210.00 DOWNSTREAM(FEET) = 2170.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.095 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.797 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" В 6.13 0.75 0.700 56 10.73 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.48 0.75 0.600 56 10.09 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.671 SUBAREA RUNOFF (CFS) = 17.78TOTAL AREA (ACRES) = 8.61 PEAK FLOW RATE (CFS) = 17.78 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.50 TO NODE 20801.00 IS CODE = 63 \_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2160.00

STREET LENGTH (FEET) = 371.36 CURB HEIGHT (INCHES) = 6.0

STREET HALFWIDTH (FEET) = 18.00

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.93
                                                                                     ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     STREET FLOW DEPTH (FEET) = 0.49
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 18.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.73
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.33
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 12.40
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.473
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
   STREET FLOW DEPTH(FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.55
                                                                                        LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.11
                                                                                    RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.88
                                                                                    "3-4 DWELLINGS/ACRE" B 0.63 0.75 0.600
 STREET FLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 11.60
                                                                                    RESIDENTIAL
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.573
                                                                                    "2 DWELLINGS/ACRE"
                                                                                                         B 5.58 0.75 0.700
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                                      Fρ
                                                Дp
                                                         SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SUBAREA AREA (ACRES) = 6.21 SUBAREA RUNOFF (CFS) = 10.94
                                                                                    EFFECTIVE AREA(ACRES) = 20.96 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 4.82 0.75 0.700 56
                                                                                    AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.32 0.75
                                                  0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
 SUBAREA AREA(ACRES) = 6.14 SUBAREA RUNOFF(CFS) = 11.41
 EFFECTIVE AREA(ACRES) = 14.75 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 14.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.57
 FLOW VELOCITY (FEET/SEC.) = 4.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.05
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20801.00 = 1078.26 FEET.
******************
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20801.00 TO NODE 20802.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2160.00 DOWNSTREAM ELEVATION(FEET) = 2153.00
 STREET LENGTH (FEET) = 226.34 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

Page 3

Date: 04/21/2014 File name: LR0208ZZ.RES

TOTAL AREA (ACRES) = 21.0 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.32 FLOW VELOCITY (FEET/SEC.) = 4.98 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.52 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20802.00 = 1304.60 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20802.00 TO NODE 20803.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2153.00 DOWNSTREAM ELEVATION(FEET) = 2138.00 STREET LENGTH (FEET) = 346.96 CURB HEIGHT (INCHES) = 6.0 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.50Date: 04/21/2014 File name: LR0208ZZ.RES Page 4

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

Fp

SCS

56

```
HALFSTREET FLOOD WIDTH (FEET) = 18.00
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.70
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.82
 STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 13.41
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.359
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                qΑ
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                       B 3.18 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 RESIDENTIAL
                       в 0.51
 "3-4 DWELLINGS/ACRE"
                                       0.75
                                                  0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA(ACRES) = 3.69
                                SUBAREA RUNOFF (CFS) = 6.13
 EFFECTIVE AREA(ACRES) = 24.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 24.7
                                PEAK FLOW RATE (CFS) =
                                                           41.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 5.72 DEPTH*VELOCITY (FT*FT/SEC.) = 2.85
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20803.00 = 1651.56 FEET.
*******************
 FLOW PROCESS FROM NODE 20803.00 TO NODE 20804.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2138.00 DOWNSTREAM ELEVATION(FEET) = 2133.00
 STREET LENGTH (FEET) = 266.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     52.14
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.59
  HALFSTREET FLOOD WIDTH (FEET) = 22.65
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.74
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.81
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 14.35
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.265
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
```

LAND USE RESIDENTIAL	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
"2 DWELLINGS/ACRE"	В	12.65	0.75	0.700	56
RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOUS SUBAREA AVERAGE PERVIOUS	JS LOSS RA JS AREA FF	ATE, Fp(IN RACTION, A	CH/HR) = 0 p = 0.690	.75	
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/F TOTAL AREA(ACRES) =	= 38.7 HR) = 0.7	75 AREA-A'	-AVERAGED F VERAGED Ap	m(INCH/HR) = 0.68	= 0.51
SUBAREA AREA-AVERAGED F 5M = 0.36; 30M = 0.73;	RAINFALL I	DEPTH(INCH	):		
END OF SUBAREA STREET IN DEPTH (FEET) = 0.62 HAY FLOW VELOCITY (FEET/SEC. *NOTE: INITIAL SUBAREA AND L = 266.3 IN WHICH EXCEEDS THE LONGEST FLOWPATH FROM IN	ALFSTREET .) = 4.97 NOMOGRAPH FT WITH EI HE TOP-OF-	FLOOD WID'  TOPTH*  WITH SUB.  LEVATION-D:  CURB STRE	VELOCITY(FT AREA PARAME ROP = 5.0 ET CAPACITY	*FT/SEC.) = TERS, FT, IS 3 AT NODE 2	32.8 CFS, 20804.00
**************************************	20804.00	TO NODE	20805.00 I	S CODE = 6	
>>>>COMPUTE STREET FLC	rion # 5	USED) <<<<	<		
UPSTREAM ELEVATION (FEET) STREET LENGTH (FEET) = STREET HALFWIDTH (FEET)	T) = 2133. 315.22	.00 DOWNS	TREAM ELEVA	TION (FEET)	
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALI OUTSIDE STREET CROSSFAL	L(DECIMAL)	= 0.020		10.00	
SPECIFIED NUMBER OF HAI STREET PARKWAY CROSSFAI Manning's FRICTION FACT MANINUM ALLOWABLE STREE	LL(DECIMAI TOR for St TOR for Ba	treetflow ack-of-Wal	20 Section(cur k Flow Sect	b-to-curb)	
**TRAVEL TIME COMPUTE  ***STREET FLOWING FUI STREETFLOW MODEL RESU STREET FLOW DEPTH (FEE HALFSTREET FLOOD WID' AVERAGE FLOW VELOCITY PRODUCT OF DEPTH&VELO STREET FLOW TRAVEL TIME  * 25 YEAR RAINFALL IN' SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/	LL***  JLTS USING  ET) = 0.6  PH(FEET) =  Y(FEET/SEC  CCITY(FT*F  E(MIN.) =  FENSITY(IN  (AMC II):	G ESTIMATE 56 = 25.95 C.) = 4 FT/SEC.) = 1.09	D FLOW: .84 3.19 TC (MIN.) = 2.168		SCS
LAND USE RESIDENTIAL "2 DWELLINGS/ACRE"		(ACRES)	(INCH/HR) 0.75	(DECIMAL)	
RESIDENTIAL					

Page 6

Date: 04/21/2014

```
"3-4 DWELLINGS/ACRE"
                      B 2.07 0.75 0.600 56
                                                                                   EFFECTIVE AREA(ACRES) = 99.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
                                                                                   TOTAL AREA (ACRES) = 99.6 PEAK FLOW RATE (CFS) = 139.97
 SUBAREA AREA (ACRES) = 10.03 SUBAREA RUNOFF (CFS) = 14.98
 EFFECTIVE AREA(ACRES) = 48.78 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 TOTAL AREA (ACRES) = 48.8 PEAK FLOW RATE (CFS) = 72.76
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
                                                                                   FLOW VELOCITY (FEET/SEC.) = 8.84 DEPTH*VELOCITY (FT*FT/SEC.) = 6.10
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                         AND L = 616.6 FT WITH ELEVATION-DROP = 30.0 FT, IS 106.7 CFS,
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.50
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20806.00
 FLOW VELOCITY (FEET/SEC.) = 4.93 DEPTH*VELOCITY (FT*FT/SEC.) = 3.30
                                                                                   LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20806.00 = 2849.67 FEET.
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20805.00 = 2233.04 FEET.
                                                                                 *****************
*******************
                                                                                   FLOW PROCESS FROM NODE 20806.00 TO NODE 20807.00 IS CODE = 63
 FLOW PROCESS FROM NODE 20805.00 TO NODE 20806.00 IS CODE = 63
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 _____
_____
                                                                                   UPSTREAM ELEVATION(FEET) = 2098.00 DOWNSTREAM ELEVATION(FEET) = 2090.00
 UPSTREAM ELEVATION(FEET) = 2128.00 DOWNSTREAM ELEVATION(FEET) = 2098.00
                                                                                   STREET LENGTH (FEET) = 573.68 CURB HEIGHT (INCHES) = 6.0
 STREET LENGTH (FEET) = 616.63 CURB HEIGHT (INCHES) = 6.0
                                                                                   STREET HALFWIDTH (FEET) = 18.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 143.24
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 108.54
                                                                                    ***STREET FLOWING FULL***
   ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.85
   STREET FLOW DEPTH (FEET) = 0.64
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 35.41
   HALFSTREET FLOOD WIDTH (FEET) = 24.91
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.26
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.27
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 18.40
 STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 16.68
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.951
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.069
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                Аp
                                                                                       LAND USE
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   RESIDENTIAL
                                                                                   "2 DWELLINGS/ACRE" B 2.85 0.75 0.700
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 36.94
                                          0.75
                                                 0.700 56
                                                                                   RESIDENTIAL
                                                                                                      B 1.45
B 0.68
 SCHOOL
                         В 3.99
                                         0.75
                                                 0.600 56
                                                                                   "3-4 DWELLINGS/ACRE"
 RESIDENTIAL
                                                                                   SCHOOL
 "3-4 DWELLINGS/ACRE"
                         B 9.63
                                         0.75
                                                 0.600 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 0.22
                                         0.75
                                                 0.900 56
                                                                                   SUBAREA AREA (ACRES) = 4.98 SUBAREA RUNOFF (CFS) = 6.54
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   EFFECTIVE AREA(ACRES) = 104.54 AREA-AVERAGED Fm(INCH/HR) = 0.51
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 SUBAREA AREA(ACRES) = 50.78 SUBAREA RUNOFF(CFS) = 71.53
                                                                                   TOTAL AREA (ACRES) = 104.5 PEAK FLOW RATE (CFS) = 139.97
```

Page 7

Date: 04/21/2014 File name: LR0208ZZ.RES

Date: 04/21/2014 File name: LR0208ZZ.RES Page 8

Fp

0.75 0.600

0.75 0.600

```
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 35.10
 FLOW VELOCITY (FEET/SEC.) = 5.52 DEPTH*VELOCITY (FT*FT/SEC.) = 4.64
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20807.00 = 3423.35 FEET.
******************
 FLOW PROCESS FROM NODE 20807.00 TO NODE 20808.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2090.00 DOWNSTREAM ELEVATION(FEET) = 2070.00
 STREET LENGTH (FEET) = 620.19 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 145.53
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 30.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.70
 STREET FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 19.75
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.870
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Аp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.19 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.94
                                          0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 9.13 SUBAREA RUNOFF (CFS) = 11.13
 EFFECTIVE AREA(ACRES) = 113.67 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 113.7 PEAK FLOW RATE (CFS) = 139.97
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
FLOW VELOCITY (FEET/SEC.) = 7.57 DEPTH*VELOCITY (FT*FT/SEC.) = 5.57
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20808.00 = 4043.54 FEET.
******************
 FLOW PROCESS FROM NODE 20808.00 TO NODE 20809.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 2070.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 545.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 25.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.38
 STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 20.54
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.826
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                  Ар
                                                           SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 20.40 0.75 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.29 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 23.69 SUBAREA RUNOFF (CFS) = 27.99
 EFFECTIVE AREA(ACRES) = 137.36 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) = 162.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.66 HALFSTREET FLOOD WIDTH (FEET) = 25.76
 FLOW VELOCITY (FEET/SEC.) = 11.63 DEPTH*VELOCITY (FT*FT/SEC.) = 7.62
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
       Date: 04/21/2014
                        File name: LR0208ZZ.RES
                                                          Page 10
```

DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.79

```
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.09
 PIPE-FLOW(CFS) = 63.16
 PIPEFLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 20.20
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.845
 SUBAREA AREA(ACRES) = 23.69 SUBAREA RUNOFF(CFS) = 28.39
 TOTAL AREA (ACRES) = 137.4
                              PEAK FLOW RATE (CFS) = 165.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 102.03
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.80
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20809.00 = 4588.54 FEET.
******************
 FLOW PROCESS FROM NODE 20809.00 TO NODE 20810.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2010.00
 STREET LENGTH (FEET) = 570.75 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 173.98
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.87
   HALFSTREET FLOOD WIDTH (FEET) = 36.57
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.52
 STREET FLOW TRAVEL TIME (MIN.) = 1.50 Tc (MIN.) = 21.71
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.767
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 12.89 0.75
                                                  0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      в 2.65
                                          0.75
                                                  0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

```
SUBAREA AREA (ACRES) = 15.54 SUBAREA RUNOFF (CFS) = 17.57
 EFFECTIVE AREA(ACRES) = 152.90 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 152.9 PEAK FLOW RATE (CFS) = 173.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.87 HALFSTREET FLOOD WIDTH (FEET) = 36.51
 FLOW VELOCITY (FEET/SEC.) = 6.32 DEPTH*VELOCITY (FT*FT/SEC.) = 5.50
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.86
                     64.54
 PIPE-FLOW(CFS) =
 PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 21.08
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.798
 SUBAREA AREA(ACRES) = 15.54
                                SUBAREA RUNOFF(CFS) = 18.01
 TOTAL AREA (ACRES) = 152.9 PEAK FLOW RATE (CFS) = 177.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 112.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 30.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20810.00 = 5159.29 FEET.
******************
 FLOW PROCESS FROM NODE 20810.00 TO NODE 20811.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2010.00 DOWNSTREAM ELEVATION(FEET) = 1970.00
 STREET LENGTH (FEET) = 617.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.65
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 197.39
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.73
```

Date: 04/21/2014

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683

Date: 04/21/2014 File name: LR0208ZZ.RES Page 11

File name: LR0208ZZ.RES Page 12

```
HALFSTREET FLOOD WIDTH (FEET) = 29.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.88
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 22.04
  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.751
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                 qΑ
                                                          SCS
      LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                       в 30.03
                                          0.75
                                                   0.700
 "2 DWELLINGS/ACRE"
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.60
                                          0.75
                                                 0.600
                                                         56
 PUBLIC PARK
                       В
                               0.12
                                        0.75 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
 SUBAREA AREA (ACRES) = 35.75 SUBAREA RUNOFF (CFS) = 39.85
 EFFECTIVE AREA(ACRES) = 188.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = 210.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.75 HALFSTREET FLOOD WIDTH (FEET) = 30.46
 FLOW VELOCITY (FEET/SEC.) = 10.93 DEPTH*VELOCITY (FT*FT/SEC.) = 8.19
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 30.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.60
 PIPE-FLOW(CFS) = 96.28
 PIPEFLOW TRAVEL TIME (MIN.) = 0.52 Tc (MIN.) = 21.60
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.772
 SUBAREA AREA(ACRES) = 35.75 SUBAREA RUNOFF(CFS) = 40.53
 TOTAL AREA(ACRES) = 188.6
                               PEAK FLOW RATE (CFS) = 214.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 118.09
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 24.36
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.88
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20811.00 = 5776.32 FEET.
*****************
 FLOW PROCESS FROM NODE 20811.00 TO NODE 20812.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1910.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1453.09 CHANNEL SLOPE = 0.0413
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             214.37
 FLOW VELOCITY (FEET/SEC.) = 4.25 FLOW DEPTH (FEET) = 1.00
 TRAVEL TIME (MIN.) = 5.70 Tc (MIN.) = 27.30
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20812.00 = 7229.41 FEET.
************************
 FLOW PROCESS FROM NODE 20812.00 TO NODE 20812.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 27.30
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.540
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                                  SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 6.60
                                     0.75
                                            0.700
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.55 0.75
                                            0.600
                                                   56
 PIIRI.TC PARK
                      В
                           18.85
                                    0.75 0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
 SUBAREA AREA(ACRES) = 26.00
                            SUBAREA RUNOFF (CFS) = 21.91
 EFFECTIVE AREA(ACRES) = 214.65 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 214.6 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20812.00 TO NODE 20813.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1870.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1523.12 CHANNEL SLOPE = 0.0263
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             214.37
 FLOW VELOCITY (FEET/SEC.) = 3.58 FLOW DEPTH (FEET) = 1.09
 TRAVEL TIME (MIN.) = 7.08 Tc (MIN.) = 34.39
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20813.00 = 8752.53 FEET.
******************
 FLOW PROCESS FROM NODE 20813.00 TO NODE 20813.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 34.39
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.341
 SUBAREA LOSS RATE DATA (AMC II):
```

Page 14

Date: 04/21/2014

DWELLINGS/ACRE" B 130.26 0.75 0.700 56 SIDENTIAL -4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 SIDENTIAL -4 DWELLINGS/ACRE" B 2.88 0.75 0.900 56 TURAL FAIR COVER	LAND USE		AKLA	Fp	Ap	SCS
SIDENTIAL DWELLINGS/ACRE" B 130.26 0.75 0.700 56 SIDENTIAL -4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 SIDENTIAL -4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 SIDENTIAL 4 DWELLING/ACRE" B 2.88 0.75 0.900 56 TURAL FAIR COVER EVEN BRUSH" B 0.24 0.61 1.000 66 BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75 BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.743 BAREA AREA (ACRES) = 453.70 AREA-AVERAGED FM (INCH/HR) = 0.54 EEA-AVERAGED FP (INCH/HR) = 0.75 AREA-AVERAGED PM = 0.72 TAL AREA (ACRES) = 453.70 AREA-AVERAGED PM = 0.72 TAL AREA (ACRES) = 453.77 PEAK FLOW RATE (CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************	DIBLIC DADK	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
DWELLINGS/ACRE" B 130.26 0.75 0.700 56 SIDENTIAL -4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 SIDENTIAL -4 DWELLINGS/ACRE" B 2.88 0.75 0.900 56 TURNAL FAIR COVER	CODFIC LWVIV	В	80.80	0.75	0.850	56
SIDENTIAL 4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 SIDENTIAL 4 DWELLING/ACRE" B 2.88 0.75 0.900 56 TUTRAL FAIR COVER PEN BRUSH" B 0.24 0.61 1.000 66 BARRA AVERAGE PERVIOUS LOS RATE, FP(INCH/HR) = 0.75 BARRA AVERAGE PERVIOUS ARRA FRACTION, Ap = 0.743 BARRA AVERAGE PENCH/HR) = 0.75 ARRA-AVERAGED FM(INCH/HR) = 0.54 EA-AVERAGED FP(INCH/HR) = 0.75 ARRA-AVERAGED PM(INCH/HR) = 0.54 EA-AVERAGED FP(INCH/HR) = 0.75 ARRA-AVERAGED PM(INCH/HR) = 327.32 BARRA ARRA-AVERAGED RAINFALL DEPTH(INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ****OWN PROCESS FROM NODE 20813.00 TO NODE 20814.00 IS CODE = 42  ****>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<*** USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) *** *********************************	RESIDENTIAL					
### A DWELLINGS/ACRE" B	'2 DWELLINGS/ACRE"	В	130.26	0.75	0.700	56
SIDENTIAL 4 DWELLING/ACRE" B 2.88 0.75 0.900 56 TURAL FAIR COVER EN BRUSH" B 0.24 0.61 1.000 66 BARRA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.742 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.75 BARRA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.75 BARRA AVERAGED FP (INCH/HR) = 0.75 BARRA AREA (ACRES) = 453.70 AREA-AVERAGED FM (INCH/HR) = 0.54 BARA-AVERAGED FP (INCH/HR) = 0.75 AREA-AVERAGED FM (INCH/HR) = 0.72 TAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 327.32  BARRA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************	RESIDENTIAL					
## A DWELLING/ACRE" B	'3-4 DWELLINGS/ACRE"	В	24.87	0.75	0.600	56
TURAL FAIR COVER  PEN BRUSH"  B	ESIDENTIAL					
TURAL FAIR COVER  PEN BRUSH"  B		В	2.88	0.75	0.900	56
PEN BRUSH" B 0.24 0.61 1.000 66  BARBA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743  BARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.54  BARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.54  BARBA AREA(ACRES) = 453.70		2	2.00	0.75	0.300	30
BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75 BARBA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743 BARBA AREA A(ACRES) = 239.05 SUBAREA RINDF(CFS) = 168.90 FECTIVE AREA (ACRES) = 453.70 AREA-AVERAGED FM(INCH/HR) = 0.54 EA-AVERAGED FP(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72 TAL AREA (ACRES) = 453.7 PEAK FLOW RATE(CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH(INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************		D	0.24	0 61	1 000	66
BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743  BAREA AREA(ACRES) = 239.05 SUBAREA RUNOFF(CFS) = 168.90  FECTIVE AREA(ACRES) = 453.70 AREA-AVERAGED FM (INCH/HR) = 0.54  EA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72  TAL AREA(ACRES) = 453.7 PEAK FLOW RATE(CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************						00
BAREA AREA (ACRES) = 239.05 SUBAREA RUNOFF (CFS) = 168.90 FECTIVE AREA (ACRES) = 453.70 AREA-AVERAGED FM (INCH/HR) = 0.54 EA-AVERAGED FD (INCH/HR) = 0.75 AREA-AVERAGED AD = 0.72 TAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************					. /3	
FECTIVE AREA (ACRES) = 453.70 AREA-AVERAGED FM (INCH/HR) = 0.54 EA-AVERAGED FP (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72 TAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************				-	~) 160	2.0
EA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72 TAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************						
TAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 327.32  BAREA AREA-AVERAGED RAINFALL DEPTH (INCH): = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************						= 0.54
BAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************	REA-AVERAGED Fp(INCH/H	IR) = 0.75	AREA-A	VERAGED Ap :	= 0.72	
= 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************	OTAL AREA(ACRES) =	453.7	PEAK	FLOW RATE (	CFS) =	327.32
= 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69  ***********************************						
**************************************	UBAREA AREA-AVERAGED F	RAINFALL DE	PTH (INCH)	):		
**************************************	M = 0.36; 30M = 0.73;	1HR = 0.96	; 3HR = 3	1.63; 6HR =	2.28; 24H	R = 4.69
OW PROCESS FROM NODE 20813.00 TO NODE 20814.00 IS CODE = 42  >>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< ><<     USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)< STREAM NODE ELEVATION(FEET) = 1870.00 WINSTREAM NODE ELEVATION(FEET) = 1800.00 OW LENGTH(FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1 PPH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW VELOCITY(FEET/SEC.) = 29.45 PE-FLOW (CFS) = 327.32  OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME(MIN.) = 0.87 TC(MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************						
>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> STREAM NODE ELEVATION(FEET) = 1870.00 WNSTREAM NODE ELEVATION(FEET) = 1800.00 OW LENGTH(FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1 PTH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW(CFS) = 327.32 OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME(MIN.) = 0.87 TC(MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************	******	******	******	*****	*****	*****
>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<>>>> STREAM NODE ELEVATION(FEET) = 1870.00 WNSTREAM NODE ELEVATION(FEET) = 1800.00 OW LENGTH(FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1 PTH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW(CFS) = 327.32 OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME(MIN.) = 0.87 TC(MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************	LOW PROCESS FROM NODE	20813.00	TO NODE	20814.00 I	S CODE =	12
USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<						
STREAM NODE ELEVATION (FEET) = 1870.00 WNSTREAM NODE ELEVATION (FEET) = 1800.00 OW LENGTH (FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1 PTH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW VELOCITY (FEET/SEC.) = 29.45 PE-FLOW (CFS) = 327.32 OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************	>>>>COMPUTE PIPE-FLOW	TRAVEL TIM	1E THRU SI	UBAREA<		
STREAM NODE ELEVATION (FEET) = 1870.00 WNSTREAM NODE ELEVATION (FEET) = 1800.00 OW LENGTH (FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1 PTH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW VELOCITY (FEET/SEC.) = 29.45 PE-FLOW (CFS) = 327.32 OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************						ESTIMATED) <<
STREAM NODE ELEVATION(FEET) = 1870.00 WNSTREAM NODE ELEVATION(FEET) = 1800.00 OW LENGTH(FEET) = 1542.94 MANNING'S N = 0.013  ER SPECIFIED PIPE DIAMETER(INCH) = 63.00 NUMBER OF PIPES = 1 PTH OF FLOW IN 63.0 INCH PIPE IS 32.2 INCHES PE-FLOW VELOCITY(FEET/SEC.) = 29.45 PE-FLOW (CFS) = 327.32 OTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PEFLOW TRAVEL TIME(MIN.) = 0.87 Tc(MIN.) = 35.26 NGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.  **********************************						
INLINE TC(MIN.) = 35.26  25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.321  BAREA LOSS RATE DATA(AMC II):  EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	DEPTH OF FLOW IN 63.0 PIPE-FLOW VELOCITY(FEET PIPE-FLOW(CFS) = 32 NOTE: USER SPECIFIED F	INCH PIPE 2/SEC.) = 27.32 PIPE SYSTEM EN.) = 0.	IS 32.2 29.45	INCHES	STREAM FLO	
INLINE TC(MIN.) = 35.26  25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.321  BAREA LOSS RATE DATA(AMC II):  EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	LONGEST FLOWPATH FROM N	******	******	*****	*****	******
25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.321  BAREA LOSS RATE DATA(AMC II):  EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BUIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N	******	******	*****	*****	******
25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.321  BAREA LOSS RATE DATA(AMC II):  EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BILC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N	20814.00	TO NODE	**************************************	*****	******
BAREA LOSS RATE DATA (AMC II):  EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA (ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	CONGEST FLOWPATH FROM N ******************* FLOW PROCESS FROM NODE	20814.00  EA TO MAINI	TO NODE	**************************************	*****	******
EVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.697  BAREA AREA (ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  ********************  *************	20814.00 	******** TO NODE 	*********** 20814.00 I: FLOW<<<<	*****	******
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN SIDENTIAL -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56 SIDENTIAL DWELLINGS/ACRE" B 58.78 0.75 0.700 56 BLIC PARK B 6.25 0.75 0.850 56 BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697 BAREA AREA (ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	**************************************	20814.00 20814.00 EA TO MAINI 2085.26 PENSITY (INC	TO NODE LINE PEAK CH/HR) =	*********** 20814.00 I: FLOW<<<<	*****	******
SIDENTIAL  -4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56  SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697  BAREA AREA (ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  **********************  LOW PROCESS FROM NODE  >>>>ADDITION OF SUBARE  AINLINE Tc(MIN.) = 3  25 YEAR RAINFALL INT  UBAREA LOSS RATE DATA(	20814.00 	TO NODEINE PEAK	********* 20814.00 I: FLOW<<<<	************ S CODE = {	********** 31 
-4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56 SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56 BLIC PARK B 6.25 0.75 0.850 56 BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697 BAREA AREA (ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  ***********************  LOW PROCESS FROM NODE	20814.00 	TO NODE  JINE PEAK  CH/HR) =	********** 20814.00 I: FLOW<<<<  1.321 Fp	***********  S CODE = {	*********** 31 
SIDENTIAL  DWELLINGS/ACRE" B 58.78 0.75 0.700 56  BLIC PARK B 6.25 0.75 0.850 56  BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  ***********************  LOW PROCESS FROM NODE  >>>>ADDITION OF SUBARE  AINLINE TC (MIN.) = 3  25 YEAR RAINFALL INT  UBAREA LOSS RATE DATA (  DEVELOPMENT TYPE/  LAND USE	20814.00 	TO NODE  JINE PEAK  CH/HR) =	********** 20814.00 I: FLOW<<<<  1.321 Fp	***********  S CODE = {	*********** 31 
DWELLINGS/ACRE" B 58.78 0.75 0.700 56 BLIC PARK B 6.25 0.75 0.850 56 BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697 BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  *********************  LOW PROCESS FROM NODE	20814.00	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)	*********  20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)	Ap (DECIMAL)	**************************************
BLIC PARK B 6.25 0.75 0.850 56 BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697 BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  **********************  LOW PROCESS FROM NODE	20814.00	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)	*********  20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)	Ap (DECIMAL)	**************************************
BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	CONGEST FLOWPATH FROM N  *******************  **************	20814.00	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)	*********  20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)	Ap (DECIMAL)	**************************************
BAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697  BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	CONGEST FLOWPATH FROM N  ******************  **LOW PROCESS FROM NODE  **>>>>ADDITION OF SUBARE  *****************  **AINLINE TC(MIN.) = 3  ** 25 YEAR RAINFALL INT  **SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/  LAND USE  **RESIDENTIAL  **SUBENTIAL  **SUBENTIAL  **SUBENTIAL  **ESIDENTIAL	20814.00  EA TO MAINI  ES5.26  CENSITY(INC (AMC II):  SCS SOIL  GROUP  B  B	TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78	********** 20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)  0.75  0.75	********** S CODE = {	**************************************
BAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697 BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	CONGEST FLOWPATH FROM N  *******************  **LOW PROCESS FROM NODE  **>>>>ADDITION OF SUBARE  *****************  **AINLINE TC(MIN.) = 3  * 25 YEAR RAINFALL INT  **BUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/  LAND USE  **ESIDENTIAL  **13-4 DWELLINGS/ACRE**  **ESIDENTIAL  **2 DWELLINGS/ACRE**	20814.00  EA TO MAINI  ES5.26  CENSITY(INC (AMC II):  SCS SOIL  GROUP  B  B	TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78	********** 20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)  0.75  0.75	********** S CODE = {	**************************************
BAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 55.08	ONGEST FLOWPATH FROM N  *********************  LOW PROCESS FROM NODE	20814.00  EA TO MAINI  ES5.26  CENSITY(INC (AMC II): SCS SOIL GROUP  B B B B	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78 6.25	********** 20814.00 I: FLOW<<<<  1.321  Fp (INCH/HR)  0.75  0.75  0.75	********** S CODE = {  Ap (DECIMAL)  0.600  0.700 0.850	**************************************
	CONGEST FLOWPATH FROM N  CONGEST FLOWPATH  CONGEST	20814.00  EA TO MAINI  ES5.26  CENSITY (INC (AMC II): SCS SOIL GROUP  B B B B B S S LOSS RAT	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78 6.25  CE, FP(INC	*********  20814.00 II  FLOW<<<<  1.321  Fp (INCH/HR)  0.75  0.75  0.75  CH/HR) = 0	********** S CODE = {  Ap (DECIMAL)  0.600  0.700 0.850	**************************************
PC.10 = (AD.\DWII)III UBBAAUVA-ABAA	ONGEST FLOWPATH FROM N  **********************  LOW PROCESS FROM NODE	20814.00  EA TO MAINI  ES.26  CENSITY (INC (AMC II):  SCS SOIL  GROUP  B  B  B  B  JS LOSS RAT  JS AREA FRA	TO NODE  JINE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78 6.25  CE, FP(ING ACTION, AN	*********  20814.00 II  FLOW<<<<  1.321  Fp (INCH/HR)  0.75  0.75  0.75  CH/HR) = 0 p = 0.697	Ap (DECIMAL)  0.600  0.700  0.850	**************************************
	ONGEST FLOWPATH FROM N  **************************  LOW PROCESS FROM NODE	20814.00  EA TO MAINI  EB TO MAINI  SCS SOIL  GROUP  B  B  B  B  B  S LOSS RAT  JS AREA FRA  76.57	TO NODE  INE PEAK  CH/HR) =  AREA (ACRES)  11.54  58.78 6.25 CE, FP(INC ACTION, AN SUBAREA  SUBAREA	*********  20814.00 II  FLOW<<<<   1.321  Fp (INCH/HR)  0.75  0.75  0.75  CH/HR) = 0 p = 0.697  A RUNOFF(CF)	Ap (DECIMAL)  0.600  0.700  0.850  .75	**************************************

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
                  530.3
                              PEAK FLOW RATE (CFS) = 374.22
 TOTAL AREA (ACRES) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
********************
 FLOW PROCESS FROM NODE 20814.00 TO NODE 20815.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1800.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1720.00
 FLOW LENGTH (FEET) = 1968.59 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 66.0 INCH PIPE IS 35.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 29.21
 PIPE-FLOW(CFS) = 374.22
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 36.38
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20815.00 = 12264.06 FEET.
******************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20815.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 36.38
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.296
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp Ap
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 28.73 0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 126.12 0.75 0.700 56
 PUBLIC PARK
                           14.88
                                    0.75 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 169.73 SUBAREA RUNOFF(CFS) = 118.43
 EFFECTIVE AREA(ACRES) = 700.00 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.71
 TOTAL AREA(ACRES) = 700.0
                             PEAK FLOW RATE (CFS) = 480.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*****************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20815.00 IS CODE = 71
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
______
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.5%; VALLEY(UNDEV.)/DESERT= 0.5%
```

Page 16

Date: 04/21/2014

```
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.53; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 700.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20815.00 = 12264.06 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0465; Lca/L=0.4,n=.0417; Lca/L=0.5,n=.0383; Lca/L=0.6,n=.0358
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 122.10
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 573.94
 TOTAL PEAK FLOW RATE(CFS) = 573.94 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 480.90
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 480.90)
 PEAK FLOW RATE (CFS) USED = 573.94
******************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20816.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00
 FLOW LENGTH (FEET) = 1236.10 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 3.00
 *GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 9.90
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 19.33
 BOX-FLOW(CFS) = 573.94
 BOX-FLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 37.45
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
*****
 FLOW PROCESS FROM NODE 20816.00 TO NODE 20816.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 37.45
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.274
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αp
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.74 0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 40.54 0.75
                                              0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
 SUBAREA AREA(ACRES) = 52.28
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.53; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 752.3
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
```

```
Lca/L=0.3,n=.0444; Lca/L=0.4,n=.0398; Lca/L=0.5,n=.0365; Lca/L=0.6,n=.0341
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 131.66
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 612.61
 TOTAL AREA (ACRES) = 752.3 PEAK FLOW RATE (CFS) = 612.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*******************
 FLOW PROCESS FROM NODE 20816.00 TO NODE 20823.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1635.00
 FLOW LENGTH (FEET) = 1150.94 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT (FEET) = 3.00 ESTIMATED BOX BASEWIDTH (FEET) = 9.64
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 21.17
 BOX-FLOW(CFS) = 612.61
 BOX-FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 38.35
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 38.35
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.256
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В 8.26 0.75 0.700
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.53 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 SUBAREA AREA(ACRES) = 10.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.53; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 763.1
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0427; Lca/L=0.4,n=.0383; Lca/L=0.5,n=.0352; Lca/L=0.6,n=.0328
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 133.63
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 615.47
 TOTAL AREA (ACRES) = 763.1 PEAK FLOW RATE (CFS) =
                                                      615.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Page 18

EOUIVALENT BASIN FACTOR APPROXIMATIONS:

Date: 04/21/2014

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
******************
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                               24.87
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                STREET FLOW DEPTH (FEET) = 0.46
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 16.55
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.35
 TOTAL NUMBER OF STREAMS = 2
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.99
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 2.56 Tc (MIN.) = 15.03
 PEAK FLOW RATE (CFS) = 615.47 Tc (MIN.) = 38.35
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.203
 AREA-AVERAGED Fm(INCH/HR) = 0.53 Ybar = 0.59
                                                                               SUBAREA LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
 TOTAL AREA (ACRES) = 763.1
                                                                                                                                   SCS
                                                                                   LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
******************
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" B 4.10
 FLOW PROCESS FROM NODE 20820.00 TO NODE 20821.00 IS CODE = 21
                                                                                                                     0.75 0.600
                                                                                                                                    56
.....
                                                                               RESIDENTIAL
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                               "2 DWELLINGS/ACRE"
                                                                                                   B 9.73 0.75 0.700
                                                                                                                                    56
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 724.32
                                                                               SUBAREA AREA(ACRES) = 13.83
                                                                                                            SUBAREA RUNOFF (CFS) = 21.18
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1720.00
                                                                               EFFECTIVE AREA(ACRES) = 21.91 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                               TOTAL AREA(ACRES) = 21.9
                                                                                                            PEAK FLOW RATE(CFS) =
                                                                                                                                     33.54
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.463
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.465
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                      Fρ
                                               Ар
                                                     SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.07
                                    0.75
                                               0.600
                                                     56 12.46
                                                                               FLOW VELOCITY (FEET/SEC.) = 4.73 DEPTH*VELOCITY (FT*FT/SEC.) = 2.35
                                                                               LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20822.00 = 1393.04 FEET.
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 6.01
                                     0.75 0.700 56 13.25
                                                                             ******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                                                                               FLOW PROCESS FROM NODE 20822.00 TO NODE 20823.00 IS CODE = 33
 SUBAREA RUNOFF (CFS) = 14.26
 TOTAL AREA (ACRES) = 8.08 PEAK FLOW RATE (CFS) = 14.26
                                                                               >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             _____
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1700.00
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1635.00
*****************
                                                                              FLOW LENGTH (FEET) = 1753.00 MANNING'S N = 0.013
 FLOW PROCESS FROM NODE 20821.00 TO NODE 20822.00 IS CODE = 63
                                                                               USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               DEPTH OF FLOW IN 33.0 INCH PIPE IS 13.0 INCHES
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               PIPE-FLOW VELOCITY (FEET/SEC.) = 15.37
_____
                                                                              PIPE-FLOW(CFS) =
                                                                                                33.54
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
                                                                               *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 STREET LENGTH (FEET) = 668.72 CURB HEIGHT (INCHES) = 6.0
                                                                               PIPEFLOW TRAVEL TIME (MIN.) = 2.02 Tc (MIN.) = 17.04
 STREET HALFWIDTH (FEET) = 18.00
                                                                               * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.043
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fр
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   LAND USE
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               RESIDENTIAL
                                                                               "2 DWELLINGS/ACRE"
                                                                                                   B 28.07 0.75 0.700
                                                                                                                                    56
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                  В 8.56
                                                                                                                     0.75 0.600
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                                                                    56
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 19

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 20

```
SUBAREA AREA (ACRES) = 36.63 SUBAREA RUNOFF (CFS) = 50.66
                                                                                3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 EFFECTIVE AREA(ACRES) = 58.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 821.6
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
                                                                                LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
 TOTAL AREA (ACRES) = 58.5 PEAK FLOW RATE (CFS) = 81.04
                                                                                EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                 Lca/L=0.3,n=.0427; Lca/L=0.4,n=.0383; Lca/L=0.5,n=.0352; Lca/L=0.6,n=.0328
                                                                                TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 144.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
                                                                                PEAK FLOW RATE (CFS) = 661.66
                                                                              ******************
 STREET CROSS-SECTION INFORMATION:
                                                                                FLOW PROCESS FROM NODE 20823.00 TO NODE 20824.00 IS CODE = 48
 CURB HEIGHT (INCHES) = 6.0
                           STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              ______
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
                                                                              _____
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1635.00 DOWNSTREAM(FEET) = 1599.00
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                FLOW LENGTH (FEET) = 1479.71 MANNING'S N = 0.014
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                *GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 12.70
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.36
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 47.50
                                                                                BOX-FLOW(CFS) = 661.66
   ***STREET FLOWING FULL***
                                                                                BOX-FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 39.77
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.
   STREET FLOW DEPTH(FEET) = 0.53
                                                                              **********************
   HALFSTREET FLOOD WIDTH (FEET) = 19.35
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.78
                                                                                FLOW PROCESS FROM NODE 20824.00 TO NODE 20824.00 IS CODE = 81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.04
 LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20823.00 = 3146.04 FEET.
                                                                                >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                              _____
******************
                                                                                MAINLINE Tc (MIN.) = 39.77
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
                                                                                * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.229
                                                                                SUBAREA LOSS RATE DATA (AMC II):
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                 DEVELOPMENT TYPE/
                                                                                                  SCS SOIL AREA
                                                                                                                    Fр
                                                                                                                              Ар
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
_____
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                     B 96.44
                                                                                                                       0.75
                                                                                                                              0.700
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                     B 25.64
                                                                                                                       0.75
                                                                                                                              0.600
 TIME OF CONCENTRATION (MIN.) = 17.04
 RAINFALL INTENSITY (INCH/HR) = 2.04
                                                                                COMMERCIAL
                                                                                                      В
                                                                                                             1.07
                                                                                                                       0.75
                                                                                                                               0.100
 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                PUBLIC PARK
                                                                                                       В
                                                                                                              0.22
                                                                                                                       0.75
                                                                                                                               0.850
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                                AGRICULTURAL FAIR COVER
                                                                                "ORCHARDS"
 AREA-AVERAGED Ap = 0.67
                                                                                                       В 3.67
                                                                                                                       0.63 1.000
 EFFECTIVE STREAM AREA(ACRES) = 58.54
                                                                                                              0.34 0.75
                                                                                SCHOOL
                                                                                                       В
                                                                                                                              0.600
 TOTAL STREAM AREA(ACRES) = 58.54
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 ** CONFLUENCE DATA **
                                                                                SUBAREA AREA(ACRES) = 127.38
                                  HEADWATER
 STREAM O Tc
                       AREA
                                                                                UNIT-HYDROGRAPH DATA:
 NUMBER (CFS) (MIN.) (ACRES) NODE
                                                                                RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
         615.47 38.35 763.07 20800.00
   1
                                                                                S-GRAPH: VALLEY(DEV.) = 99.3%; VALLEY(UNDEV.) / DESERT = 0.7%
          81.04 17.04
                        58.54
                                  20820.00
                                                                                       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.53; Ybar = 0.59
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 UNIT-HYDROGRAPH DATA:
                                                                                DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
                                                                                3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
                                                                                UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 949.0
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.
 Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.53; Ybar = 0.59
                                                                                EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                Lca/L=0.3, n=.0409; Lca/L=0.4, n=.0367; Lca/L=0.5, n=.0337; Lca/L=0.6, n=.0314
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
                                                                                TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 167.53
```

Page 21

Date: 04/21/2014

File name: LR020877.RFS

Date: 04/21/2014 File name: LR0208ZZ.RES Page 22

56

56

56

56

6.5

```
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 745.37
 TOTAL AREA (ACRES) = 949.0
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
**********************
 FLOW PROCESS FROM NODE 20824.00 TO NODE 20825.00 IS CODE = 42
_____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1599.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1550.00
 FLOW LENGTH (FEET) = 1211.57 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 81.0 INCH PIPE IS 47.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 34.56
 PIPE-FLOW(CFS) =
                 745.37
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 40.36
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20825.00 = 17342.38 FEET.
*****************
 FLOW PROCESS FROM NODE 20825.00 TO NODE 20825.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 40.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.218
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                      SCS
                                                αA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           10.70
                                        0.75
                                               0.600
                                                       56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В
                              31.03
                                        0.75
                                                0.700
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               0.52
                                        0.63
                                               1.000
                                                      65
                        В
 PUBLIC PARK
                        В
                               6.54
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
 SUBAREA AREA(ACRES) = 48.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.53; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
                                            997.8
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20825.00 = 17342.38 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0393; Lca/L=0.4, n=.0352; Lca/L=0.5, n=.0324; Lca/L=0.6, n=.0302
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 176.11
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 773.91
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
FLOW PROCESS FROM NODE 20825.00 TO NODE 20826.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1535.00
 FLOW LENGTH (FEET) = 755.22 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 93.0 INCH PIPE IS 54.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 26.70
 PIPE-FLOW(CFS) = 773.91
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 40.83
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
*************************
 FLOW PROCESS FROM NODE 20826.00 TO NODE 20826.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 40.83
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.209
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                    Fρ
                                                Αр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                             9.73 0.75
                                               0.600
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               0.52
                                       0.63 1.000
                        В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA(ACRES) = 10.25
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.68; LAG(HR) = 0.54; Fm(INCH/HR) = 0.53; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1008.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0383; Lca/L=0.4,n=.0344; Lca/L=0.5,n=.0316; Lca/L=0.6,n=.0295
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 178.16
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 774.41
 TOTAL AREA (ACRES) = 1008.0 PEAK FLOW RATE (CFS) = 774.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
```

File name: LR020877.RFS

Page 24

PEAK FLOW RATE(CFS) = 773.91

TOTAL AREA(ACRES) = 997.8

Date: 04/21/2014

```
*************************
 FLOW PROCESS FROM NODE 20826.00 TO NODE 20827.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1500.00
 FLOW LENGTH (FEET) = 969.04 MANNING'S N = 0.013
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
 FLOWDEPTH IN BOX IS 2.52 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 30.70
 BOX-FLOW(CFS) = 774.41
 BOX-FLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 41.36
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
********************
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20827.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 41.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.200
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                              Дp
                                                     SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              21.08
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.08
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.52; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1029.1
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0373; Lca/L=0.4, n=.0335; Lca/L=0.5, n=.0307; Lca/L=0.6, n=.0287
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 182.45
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 781.44
 TOTAL AREA(ACRES) = 1029.1 PEAK FLOW RATE(CFS) = 781.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20828.00 IS CODE = 48
._____
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1480.00
 FLOW LENGTH (FEET) = 712.41 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
```

```
*GIVEN BOX HEIGHT (FEET) = 3.50 ESTIMATED BOX BASEWIDTH (FEET) = 11.23
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 19.87
 BOX-FLOW(CFS) = 781.44
 BOX-FLOW TRAVEL TIME (MIN.) = 0.60 Tc (MIN.) = 41.95
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
*******************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20828.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 41.95
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.190
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                             Aр
                                                     SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             24.73 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 24.73
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.70; LAG(HR) = 0.56; Fm(INCH/HR) = 0.52; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1053.8
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0368; Lca/L=0.4,n=.0329; Lca/L=0.5,n=.0303; Lca/L=0.6,n=.0282
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 187.48
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 788.75
 TOTAL AREA (ACRES) = 1053.8 PEAK FLOW RATE (CFS) = 788.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*****************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20829.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 766.85 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 10.00 GIVEN BOX HEIGHT (FEET) = 3.50
 *GIVEN BOX HEIGHT(FEET) = 3.50 ESTIMATED BOX BASEWIDTH(FEET) = 13.25
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.00
 BOX-FLOW(CFS) = 788.75
 BOX-FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 42.71
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
*****************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 81
```

Page 26

Date: 04/21/2014 File name: LR0208ZZ.RES Page 25 Date: 04/21/2014 File name: LR0208ZZ.RES

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 MAINLINE Tc(MIN.) = 42.71
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.177
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.31 0.75
                                               0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 13.31
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
 S-GRAPH: VALLEY (DEV.) = 99.2%; VALLEY (UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.52; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298; Lca/L=0.6,n=.0278
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 190.18
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 780.16
                             PEAK FLOW RATE(CFS) = 788.75
 TOTAL AREA (ACRES) = 1067.2
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
********************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20764.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1299.02 Tc (MIN.) = 40.70
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.53
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
*******************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1299.02 Tc (MIN.) = 40.70
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.53
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
********************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20829.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 1297.04 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 15.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 2.75 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 31.50
 BOX-FLOW(CFS) = 1299.02
 BOX-FLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 41.38
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
*****************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1299.02 Tc (MIN.) = 41.38
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.53
 TOTAL AREA(ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 788.75 Tc (MIN.) = 42.71
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.58
 TOTAL AREA (ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.87
 S-GRAPH: VALLEY(DEV.) = 92.0%; VALLEY(UNDEV.) / DESERT = 8.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.50; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2763.5
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0321; Lca/L=0.4, n=.0288; Lca/L=0.5, n=.0265; Lca/L=0.6, n=.0247
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 537.19
 PEAK FLOW RATE (CFS) = 1942.38
```

File name: LR020877.RFS

Page 28

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
*****
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20852.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1413.00
 FLOW LENGTH (FEET) = 2003.77 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 24.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 2.76 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 29.33
 BOX-FLOW(CFS) = 1942.38
 BOX-FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 42.52
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1942.38 Tc (MIN.) = 42.52
 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.55
 TOTAL AREA (ACRES) =
*****************
 FLOW PROCESS FROM NODE 20830.00 TO NODE 20831.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 814.59
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1475.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.868
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.836
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fр
                                       Aр
                                             SCS Tc
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                       0.600
                   В
                         6.12
                                 0.75
                                            56 13.37
                                       0.100
 COMMERCIAL
                   В
                         1.79
                                 0.75
                                                 9.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.487
 SUBAREA RUNOFF (CFS) = 17.59
 TOTAL AREA (ACRES) = 7.91 PEAK FLOW RATE (CFS) = 17.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
```

File name: LR020877.RFS

Page 29

Date: 04/21/2014

```
>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1475.00
 DOWNSTREAM NODE ELEVATION(FEET) = 1464.00
 FLOW LENGTH (FEET) = 301.44 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 7.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.62
 PIPE-FLOW(CFS) =
                  17.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 10.33
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.759
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                     Fр
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                               7.31
                                        0.75 0.600
                                                        56
 COMMERCIAL
                        В
                               3.62 0.75
                                                0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.434
 SUBAREA AREA(ACRES) = 10.93
                              SUBAREA RUNOFF (CFS) = 23.95
 EFFECTIVE AREA(ACRES) = 18.84 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 18.8
                                PEAK FLOW RATE(CFS) =
                                                         41.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                            STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 23.41
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.02
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20832.00 = 1116.03 FEET.
FLOW PROCESS FROM NODE 20832.00 TO NODE 20833.00 IS CODE = 42
._____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
```

FLOW PROCESS FROM NODE 20831.00 TO NODE 20832.00 IS CODE = 33

Date: 04/21/2014 File name: LR0208ZZ.RES Page 30

UPSTREAM NODE ELEVATION (FEET) = 1464.00

```
DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
 FLOW LENGTH (FEET) = 991.27 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 12.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.96
 PIPE-FLOW(CFS) =
                  41.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 11.60
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20833.00 = 2107.30 FEET.
******************
 FLOW PROCESS FROM NODE 20833.00 TO NODE 20833.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.60
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.573
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В 23.09
                                     0.75
                                            0.600 56
 COMMERCIAL
                     В
                            9.26
                                   0.75
                                           0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
 SUBAREA AREA(ACRES) = 32.35
                            SUBAREA RUNOFF (CFS) = 64.97
 EFFECTIVE AREA(ACRES) = 51.19 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA(ACRES) = 51.2 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*************************
 FLOW PROCESS FROM NODE 20833.00 TO NODE 20852.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1440.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1413.00
 FLOW LENGTH (FEET) = 1064.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 19.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.24
 PIPE-FLOW(CFS) = 102.81
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 12.63
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20852.00 = 3171.64 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 12.63
```

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.445
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
   LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.67 0.75 0.600
                                                  56
                           3.54 0.75 0.250
 MOBILE HOME PARK
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA(ACRES) = 6.21
                           SUBAREA RUNOFF(CFS) = 11.99
 EFFECTIVE AREA(ACRES) = 57.40 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 57.4
                             PEAK FLOW RATE(CFS) =
                                                 108.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*****************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
_______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 12.63
 RAINFALL INTENSITY (INCH/HR) = 2.45
 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45
 EFFECTIVE STREAM AREA(ACRES) = 57.40
 TOTAL STREAM AREA(ACRES) = 57.40
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 108.91
*******************
 FLOW PROCESS FROM NODE 20840.00 TO NODE 20841.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 708.14
 ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1600.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.898
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.241
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                           Αp
                                                  SCS Tc
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                           3.00
                                     0.75
                                           0.500
                                                   56 10.11
                                                  56 7.90
 COMMERCIAL
                      В 5.71
                                    0.75
                                           0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.09
                                    0.75
                                           0.600
                                                  56 10.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.278
 SUBAREA RUNOFF (CFS) = 26.75
 TOTAL AREA(ACRES) = 9.80 PEAK FLOW RATE(CFS) =
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 31 Date: 04/21/2014 File name: LR0208ZZ.RES Page 32

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
FLOW PROCESS FROM NODE 20841.00 TO NODE 20842.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1580.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 218.02 CHANNEL SLOPE = 0.0917
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            26.75
 FLOW VELOCITY (FEET/SEC.) = 4.60 FLOW DEPTH (FEET) = 0.62
 TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 8.69
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20842.00 = 926.16 FEET.
FLOW PROCESS FROM NODE 20842.00 TO NODE 20842.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 8.69
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.061
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                    Fρ
                                            Αp
                                                 SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                 56
 MOBILE HOME PARK
                    В
                            3.16
                                    0.75
                                           0.250
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                  В
                            2.28
                                    0.75
                                           0.500
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                            1.36
                                    0.75
                                           0.600
                      В
                            1.50
                                    0.75
                                           0.100
 COMMERCIAL
                            0.63
                                           0.850
 PUBLIC PARK
                      В
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.384
 SUBAREA AREA(ACRES) = 8.93 SUBAREA RUNOFF(CFS) = 22.29
 EFFECTIVE AREA(ACRES) = 18.73 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 TOTAL AREA (ACRES) = 18.7 PEAK FLOW RATE (CFS) = 47.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
**********************
 FLOW PROCESS FROM NODE 20842.00 TO NODE 20843.00 IS CODE = 54
......
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1560.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 248.99 CHANNEL SLOPE = 0.0803
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             47.45
 FLOW VELOCITY (FEET/SEC.) = 5.06 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 9.51
```

```
LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20843.00 = 1175.15 FEET.
******************
 FLOW PROCESS FROM NODE 20843.00 TO NODE 20843.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 9.51
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.899
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap
                                                   SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                    В
                           4.09 0.75
                                            0.250
                      В
                             1.15
                                     0.75
 PUBLIC PARK
                                            0.850
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.11
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386
 SUBAREA AREA(ACRES) = 5.35 SUBAREA RUNOFF(CFS) = 12.57
 EFFECTIVE AREA(ACRES) = 24.08 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 24.1
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
********************
 FLOW PROCESS FROM NODE 20843.00 TO NODE 20844.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1560.00 DOWNSTREAM(FEET) = 1557.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 185.64 CHANNEL SLOPE = 0.0162
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              57.30
 FLOW VELOCITY (FEET/SEC.) = 2.89 FLOW DEPTH (FEET) = 1.15
 TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 10.58
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20844.00 = 1360.79 FEET.
*****************
 FLOW PROCESS FROM NODE 20844.00 TO NODE 20844.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 10.58
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.720
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                         2.82
 MOBILE HOME PARK
                    В
                                     0.75
                                            0.250
 PUBLIC PARK
                            1.93
                                     0.75
                                            0.850
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 0.39
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
 SUBAREA AREA (ACRES) = 5.14 SUBAREA RUNOFF (CFS) = 10.84
```

Page 34

Date: 04/21/2014

```
29.22 AREA-AVERAGED Fm(INCH/HR) = 0.28
 EFFECTIVE AREA(ACRES) =
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37
 TOTAL AREA(ACRES) = 29.2 PEAK FLOW RATE(CFS) =
                                                    64.25
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20844.00 TO NODE 20845.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1555.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 193.68 CHANNEL SLOPE = 0.0103
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              64.25
 FLOW VELOCITY (FEET/SEC.) = 2.53 FLOW DEPTH (FEET) = 1.30
 TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 11.86
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20845.00 = 1554.47 FEET.
********************
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20845.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 11.86
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.540
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   В
                          0.75
 MOBILE HOME PARK
                                     0.75
                                             0.250
 PUBLIC PARK
                     В
                            1.88
                                     0.75
                                             0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.24
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AREA(ACRES) = 2.87
                             SUBAREA RUNOFF (CFS) = 5.26
 EFFECTIVE AREA(ACRES) = 32.09 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
 TOTAL AREA (ACRES) = 32.1
                            PEAK FLOW RATE(CFS) =
                                                    64.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20846.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1552.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 263.74 CHANNEL SLOPE = 0.0114
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             64.78
 FLOW VELOCITY (FEET/SEC.) = 2.62 FLOW DEPTH (FEET) = 1.28
```

```
TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 13.53
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20846.00 = 1818.21 FEET.
FLOW PROCESS FROM NODE 20846.00 TO NODE 20846.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 13.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.346
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                        0.82 0.75 0.250
                   В
 MOBILE HOME PARK
                                                56
                   В
 PUBLIC PARK
                         2.06
                                  0.75
                                         0.850
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                         0.10 0.75
                                         0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 SUBAREA AREA(ACRES) = 2.98
                           SUBAREA RUNOFF (CFS) = 4.93
 EFFECTIVE AREA(ACRES) = 35.07 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
 TOTAL AREA(ACRES) = 35.1
                            PEAK FLOW RATE(CFS) =
                                                64.78
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20846.00 TO NODE 20847.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1552.00 DOWNSTREAM(FEET) = 1550.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 185.20 CHANNEL SLOPE = 0.0108
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            64.78
 FLOW VELOCITY (FEET/SEC.) = 2.56 FLOW DEPTH (FEET) = 1.30
 TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 14.74
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20847.00 = 2003.41 FEET.
******************
 FLOW PROCESS FROM NODE 20847.00 TO NODE 20847.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 14.74
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.229
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                SCS SOIL AREA
                                Fρ
                                        αA
                                               SCS
  LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   В
                         2.48
                                  0.75
                                        0.250
 MOBILE HOME PARK
                                                56
 PUBLIC PARK
                           2.79
                                  0.75 0.850
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.16 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 36

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.569
 SUBAREA AREA (ACRES) = 5.43 SUBAREA RUNOFF (CFS) = 8.81
 EFFECTIVE AREA(ACRES) = 40.50 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44
 TOTAL AREA (ACRES) = 40.5 PEAK FLOW RATE (CFS) = 69.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*************
 FLOW PROCESS FROM NODE 20847.00 TO NODE 20848.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1540.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.70 CHANNEL SLOPE = 0.0269
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             69.23
 FLOW VELOCITY (FEET/SEC.) = 3.69 FLOW DEPTH (FEET) = 1.12
 TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 16.42
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20848.00 = 2375.11 FEET.
******************
 FLOW PROCESS FROM NODE 20848.00 TO NODE 20848.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.42
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.089
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   B 0.62 0.75 0.250 56
 MOBILE HOME PARK
 PUBLIC PARK
                    В
                            5.12
                                    0.75 0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.12 0.75
                                          0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.781
 SUBAREA AREA (ACRES) = 5.86 SUBAREA RUNOFF (CFS) = 7.93
 EFFECTIVE AREA(ACRES) = 46.36 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 46.4 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
FLOW PROCESS FROM NODE 20848.00 TO NODE 20849.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1540.00 DOWNSTREAM(FEET) = 1510.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.67 CHANNEL SLOPE = 0.0924
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
```

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                             72.07
 FLOW VELOCITY (FEET/SEC.) = 5.89 FLOW DEPTH (FEET) = 0.90
 TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 17.34
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20849.00 = 2699.78 FEET.
FLOW PROCESS FROM NODE 20849.00 TO NODE 20849.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 17.34
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.022
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                                  Fρ
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   B 1.44 0.75 0.850
 PUBLIC PARK
 MOBILE HOME PARK
                    B 0.53 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.02 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA (ACRES) = 1.99 SUBAREA RUNOFF (CFS) = 2.70
 EFFECTIVE AREA(ACRES) = 48.35 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 48.4 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
******************
 FLOW PROCESS FROM NODE 20849.00 TO NODE 20850.00 IS CODE = 63
_______
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1497.00
 STREET LENGTH (FEET) = 288.19 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               85.24
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.60
  HALFSTREET FLOOD WIDTH (FEET) = 23.08
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.49
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.50
 STREET FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 17.98
```

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 38

* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.978 SUBAREA LOSS RATE DATA(AMC II):	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	"3-4 DWELLINGS/ACRE" B 82.38 0.75 0.600 56
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	MOBILE HOME PARK B 10.87 0.75 0.250 56
MOBILE HOME PARK B 1.94 0.75 0.250 56 MOBILE HOME PARK B 9.09 0.75 0.250 56	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.559
AGRICULTURAL FAIR COVER "ORCHARDS" B 5.99 0.63 1.000 65	SUBAREA AREA(ACRES) = 93.25 SUBAREA RUNOFF(CFS) = 103.26 EFFECTIVE AREA(ACRES) = 159.70 AREA-AVERAGED Fm(INCH/HR) = 0.40
PUBLIC PARK B 1.08 0.75 0.850 56	AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67	TOTAL AREA (ACRES) = 159.7 PEAK FLOW RATE (CFS) = 179.98
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.534	Total and thousand 1931, The table (919) 173190
SUBAREA AREA(ACRES) = 18.10 SUBAREA RUNOFF(CFS) = 26.35	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
EFFECTIVE AREA(ACRES) = 66.45 AREA-AVERAGED Fm(INCH/HR) = 0.37	5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.50	
TOTAL AREA (ACRES) = 66.5 PEAK FLOW RATE (CFS) = 96.42	END OF SUBAREA STREET FLOW HYDRAULICS:
	DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 34.92
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	FLOW VELOCITY (FEET/SEC.) = 7.17 DEPTH*VELOCITY (FT*FT/SEC.) = 6.01
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69	*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
END OF CUDADEA CODEED FLOW HADDAULICG.	AND L = 2619.3 FT WITH ELEVATION-DROP = 62.0 FT, IS 139.4 CFS,
END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 24.18	WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20851.00  LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20851.00 = 5607.30 FEET.
FLOW VELOCITY (FEET/SEC.) = 7.76 DEPTH*VELOCITY (FT*FT/SEC.) = 4.84	LONGEST FLOWFAIR FROM NODE 20040.00 TO NODE 20051.00 - 3007.30 FEBT.
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,	******************
AND L = $288.2$ FT WITH ELEVATION-DROP = $13.0$ FT, IS $56.3$ CFS,	FLOW PROCESS FROM NODE 20851.00 TO NODE 20852.00 IS CODE = 42
WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20850.00	
LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20850.00 = 2987.97 FEET.	>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
	>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
*******************	
FLOW PROCESS FROM NODE 20850.00 TO NODE 20851.00 IS CODE = 63	UPSTREAM NODE ELEVATION(FEET) = 1435.00 DOWNSTREAM NODE ELEVATION(FEET) = 1413.00
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA	FLOW LENGTH (FEET) = 1025.18 MANNING'S N = 0.013
>>>> (STREET TABLE SECTION # 5 USED) <<<<	THOW EDMOTINGED TO THE TRANSPORT OF THE
	USER SPECIFIED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
UPSTREAM ELEVATION(FEET) = 1497.00 DOWNSTREAM ELEVATION(FEET) = 1435.00	DEPTH OF FLOW IN 54.0 INCH PIPE IS 30.9 INCHES
STREET LENGTH (FEET) = 2619.33 CURB HEIGHT (INCHES) = 6.0	PIPE-FLOW VELOCITY(FEET/SEC.) = 19.11
STREET HALFWIDTH(FEET) = 18.00	PIPE-FLOW(CFS) = 179.98
DICHANCE EDOM CDOWN HO CDOCCEAST CDADEDDEAN/EEEM) - 10 00	*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020	PIPEFLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 25.26 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20852.00 = 6632.48 FEET.
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	LONGESI FLOWFAIR FROM NODE 20040.00 TO NODE 20032.00 - 0032.40 FEBI.
OTOTOL OTHER CHOOFINE (DECIME)	******************
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020	
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86	MAINLINE Tc(MIN.) = 25.26
AARDANINA MANA GONDUNDO NOTAGO DOMENAMOD DE ON (GDO) 140 20	* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.613
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 148.30  ***STREET FLOWING FULL***	SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
STREET FLOW DEPTH (FEET) = 0.79	RESIDENTIAL
HALFSTREET FLOOD WIDTH(FEET) = 32.36	"3-4 DWELLINGS/ACRE" B 12.28 0.75 0.600 56
AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.84	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.39	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
STREET FLOW TRAVEL TIME (MIN.) = 6.38 Tc (MIN.) = 24.36	
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.649	SUBAREA AREA(ACRES) = 12.28 SUBAREA RUNOFF(CFS) = 12.87
	EFFECTIVE AREA(ACRES) = 171.98 AREA-AVERAGED Fm(INCH/HR) = 0.40
SUBAREA LOSS RATE DATA(AMC II):	EFFECTIVE AREA(ACRES) = 171.98 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
	EFFECTIVE AREA(ACRES) = 171.98 AREA-AVERAGED Fm(INCH/HR) = 0.40

Date: 04/21/2014 File name: LR0208ZZ.RES Page 39 File name: LR0208ZZ.RES Page 40

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69
*************************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
______
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.26
 RAINFALL INTENSITY (INCH/HR) = 1.61
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.54
 EFFECTIVE STREAM AREA(ACRES) = 171.98
 TOTAL STREAM AREA(ACRES) = 171.98
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 187.78
 ** CONFLUENCE DATA **
 STREAM Q TC AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
   1 1942.38 42.52 2763.54 20620.00
       108.91 12.63 57.40 20830.00
   3
       187.78 25.26 171.98 20840.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.86
 S-GRAPH: VALLEY(DEV.) = 92.4%; VALLEY(UNDEV.) / DESERT = 7.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.49; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.87; 30M = 0.87; 1HR = 0.87;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0309; Lca/L=0.4,n=.0277; Lca/L=0.5,n=.0254; Lca/L=0.6,n=.0237
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 588.37
 PEAK FLOW RATE(CFS) = 2033.20
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<< <
______
 PEAK FLOWRATE TABLE FILE NAME: 20852.DNA
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 2992.9 TC (MIN.) = 42.52
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.54
 PEAK FLOW RATE (CFS) = 2033.20
_____
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 41 Date: 04/21/2014 File name: LR0208ZZ.RES Page 42

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2012 Advanced Engineering Software (aes) Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20968

15

36.0

16 12.5

20.0

5.0

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

17 20.0

18 26.0

19 52.0

10.0

15.0

20.0

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0209ZZ.DAT

TIME/DATE OF STUDY: 08:04 11/19/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0

15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 0.67 2.00 0.0312 0.167 0.0180 20.0 0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020 0.50

1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20900.00 TO NODE 20901.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 751.64 ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1798.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.372 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.752 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL ".4 DWELLING/ACRE" 0.85 0.75 0.900 56 12.26 RESIDENTIAL "3-4 DWELLINGS/ACRE" 0.85 0.75 0.600 56 10.37 RESIDENTIAL 8.78 "2 DWELLINGS/ACRE" R 0.75 0.700 56 11.03 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708 SUBAREA RUNOFF (CFS) = 20.96TOTAL AREA (ACRES) = 10.48 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62FLOW PROCESS FROM NODE 20901.00 TO NODE 20902.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1798.00 DOWNSTREAM ELEVATION(FEET) = 1770.00 Date: 04/21/2014 File name: LR020977.RFS Page 2

0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

0.020/0.020/0.020 0.67

0.020/0.020/0.020 0.67

Date: 04/21/2014 File name: LR020977.RFS Page 1

0.67

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

```
STREET LENGTH (FEET) = 427.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREET FLOW DEPTH(FEET) = 0.50
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 18.20
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.52
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.82
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.28
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 13.29
   STREET FLOW DEPTH (FEET) = 0.41
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.371
   HALFSTREET FLOOD WIDTH (FEET) = 14.37
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.92
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
                                                                                     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 11.58
                                                                                 RESIDENTIAL
                                                                                 ".4 DWELLING/ACRE" B 2.12
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.576
                                                                                                                         0.75
                                                                                                                                 0.900
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                 "3-4 DWELLINGS/ACRE" B 0.54 0.75 0.600
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 RESIDENTIAL
                                                                                 "2 DWELLINGS/ACRE" B 2.53 0.75 0.700
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 2.43
                                         0.75
                                                0.900
                                                      56
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.771
 "3-4 DWELLINGS/ACRE" B 0.53
                                         0.75
                                                0.600
                                                       56
                                                                                 SUBAREA AREA (ACRES) = 5.19 SUBAREA RUNOFF (CFS) = 8.38
                                                                                 EFFECTIVE AREA(ACRES) = 21.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.46 0.75 0.700 56
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 TOTAL AREA (ACRES) = 21.1 PEAK FLOW RATE (CFS) = 34.47
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.780
 SUBAREA AREA (ACRES) = 5.42 SUBAREA RUNOFF (CFS) = 9.72
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 29.03
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.58 DEPTH*VELOCITY (FT*FT/SEC.) = 2.33
                                                                                 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20903.00 = 1644.63 FEET.
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                                *****************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.07
                                                                                 FLOW PROCESS FROM NODE 20903.00 TO NODE 20904.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 6.07 DEPTH*VELOCITY (FT*FT/SEC.) = 2.60
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20902.00 = 1179.32 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
*******************
                                                                                _____
 FLOW PROCESS FROM NODE 20902.00 TO NODE 20903.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 1758.00 DOWNSTREAM ELEVATION(FEET) = 1750.00
______
                                                                                 STREET LENGTH (FEET) = 486.20 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1758.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 465.31 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

33.22

56

56

Date: 04/21/2014 File name: LR0209ZZ.RES Date: 04/21/2014 File name: LR0209ZZ.RES Page 3 Page 4 RESIDENTIAL

".4 DWELLING/ACRE"

RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.03 0.75 0.600 56 RESIDENTIAL B 15.54 0.75 0.700 56 "2 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.727 SUBAREA AREA(ACRES) = 21.52 SUBAREA RUNOFF(CFS) = 32.02 EFFECTIVE AREA(ACRES) = 42.61 AREA-AVERAGED Fm(INCH/HR) = 0.55 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73TOTAL AREA(ACRES) = 42.6 PEAK FLOW RATE(CFS) = 63.19

0.75

0.900

56

В 3.95

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH (FEET) = 0.64 HALFSTREET FLOOD WIDTH (FEET) = 24.97 FLOW VELOCITY (FEET/SEC.) = 4.79 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.06 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,

AND L = 486.2 FT WITH ELEVATION-DROP = 8.0 FT, IS 40.6 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20904.00 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20904.00 = 2130.83 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20904.00 TO NODE 20905.00 IS CODE = 63 \_\_\_\_\_\_

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 5 USED) <<<<

\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1750.00 DOWNSTREAM ELEVATION(FEET) = 1715.00 STREET LENGTH (FEET) = 660.51 CURB HEIGHT (INCHES) = 6.0

STREET HALFWIDTH (FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.69

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.58HALFSTREET FLOOD WIDTH (FEET) = 21.86 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.74 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.46 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 16.52 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.082 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL ".4 DWELLING/ACRE" B 8.61 0.75 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.14 0.75 RESIDENTIAL "2 DWELLINGS/ACRE" B 13.33 0.75 0.700 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.763 SUBAREA AREA (ACRES) = 24.08 SUBAREA RUNOFF (CFS) = 32.75 EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.56 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74 TOTAL AREA (ACRES) = 66.7 PEAK FLOW RATE (CFS) = 91.51 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 23.02 FLOW VELOCITY (FEET/SEC.) = 8.08 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.85 \*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20905.00 TO NODE 20906.00 IS CODE = 63

AND L = 660.5 FT WITH ELEVATION-DROP = 35.0 FT, IS 48.8 CFS, WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20905.00 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20905.00 = 2791.34 FEET.

79.58

0.900

0.600

SCS

56

56

Page 6

\_\_\_\_\_\_

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1670.00 STREET LENGTH (FEET) = 1223.70 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 101.77 \*\*\*STREET FLOWING FULL\*\*\*

Date: 04/21/2014 File name: LR0209ZZ.RES Page 5

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.79
 STREET FLOW TRAVEL TIME (MIN.) = 2.78 Tc (MIN.) = 19.30
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.896
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                              Ар
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      в 7.55
                                     0.75
                                                0.900
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61
                                        0.75
                                                0.600
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 8.18 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778
 SUBAREA AREA(ACRES) = 17.34 SUBAREA RUNOFF(CFS) = 20.51
 EFFECTIVE AREA(ACRES) = 84.03 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 84.0 PEAK FLOW RATE (CFS) = 100.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.58
 FLOW VELOCITY(FEET/SEC.) = 7.30 DEPTH*VELOCITY(FT*FT/SEC.) = 4.76
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20906.00 = 4015.04 FEET.
*****
 FLOW PROCESS FROM NODE 20906.00 TO NODE 20920.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1670.00 DOWNSTREAM ELEVATION (FEET) = 1600.00
 STREET LENGTH (FEET) = 1513.04 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.28
```

```
STREET FLOW TRAVEL TIME (MIN.) = 3.09 Tc (MIN.) = 22.39
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.734
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.66
                                     0.75
                                            0.600
                                                   56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 8.47
                                     0.75
                                            0.700
                                                   56
 AGRICULTURAL FAIR COVER
                      B 0.16
 "ORCHARDS"
                                     0.63 1.000
                                                   6.5
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 7.50 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.768
 SUBAREA AREA (ACRES) = 18.79 SUBAREA RUNOFF (CFS) = 19.63
 EFFECTIVE AREA(ACRES) = 102.82 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 108.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.15
 FLOW VELOCITY (FEET/SEC.) = 8.09 DEPTH*VELOCITY (FT*FT/SEC.) = 5.20
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20920.00 = 5528.08 FEET.
*******************
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20920.00 IS CODE = 1
.....
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 22.39
 RAINFALL INTENSITY (INCH/HR) = 1.73
 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 102.82
 TOTAL STREAM AREA(ACRES) = 102.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 108.27
******************
 FLOW PROCESS FROM NODE 20910.00 TO NODE 20911.00 IS CODE = 21
______
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 679.60
 ELEVATION DATA: UPSTREAM(FEET) = 1825.00 DOWNSTREAM(FEET) = 1795.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.443
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.741
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
      Date: 04/21/2014 File name: LR0209ZZ.RES
                                                  Page 8
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B
                             0.59
                                     0.75
                                            0.600
                                                   56 10.44
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                           4.98
                                     0.75 0.900
                                                  56 12.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.868
 SUBAREA RUNOFF (CFS) =
                    10.48
 TOTAL AREA (ACRES) =
                     5.57 PEAK FLOW RATE (CFS) = 10.48
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
******************
 FLOW PROCESS FROM NODE 20911.00 TO NODE 20912.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1795.00 DOWNSTREAM(FEET) = 1780.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 216.45 CHANNEL SLOPE = 0.0693
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              10.48
 FLOW VELOCITY (FEET/SEC.) = 2.84 FLOW DEPTH (FEET) = 0.38
 TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 11.71
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20912.00 = 896.05 FEET.
******************
 FLOW PROCESS FROM NODE 20912.00 TO NODE 20912.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 11.71
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.558
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           0.20
                                     0.75
                                             0.600
                                                  56
 RESIDENTIAL
                           5.94
                                     0.75
                                            0.900
 ".4 DWELLING/ACRE"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890
 SUBAREA AREA (ACRES) = 6.14 SUBAREA RUNOFF (CFS) = 10.46
 EFFECTIVE AREA(ACRES) = 11.71 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 11.7 PEAK FLOW RATE(CFS) =
                                                    20.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
*****************
 FLOW PROCESS FROM NODE 20912.00 TO NODE 20913.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 292.78 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               20.03
 FLOW VELOCITY (FEET/SEC.) = 2.61 FLOW DEPTH (FEET) = 0.55
 TRAVEL TIME (MIN.) = 1.87 Tc (MIN.) = 13.58
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20913.00 = 1188.83 FEET.
******************
 FLOW PROCESS FROM NODE 20913.00 TO NODE 20913.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 13.58
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.341
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                             Αp
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.69
                                     0.75
                                            0.600
                                                    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                           9.60 0.75
                                            0.900
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA(ACRES) = 10.29
                             SUBAREA RUNOFF (CFS) = 15.58
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 22.0
                                                   33.32
                            PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
******************
 FLOW PROCESS FROM NODE 20913.00 TO NODE 20914.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1740.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 493.77 CHANNEL SLOPE = 0.0608
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              33.32
 FLOW VELOCITY (FEET/SEC.) = 3.11 FLOW DEPTH (FEET) = 0.46
 TRAVEL TIME (MIN.) = 2.64 Tc (MIN.) = 16.23
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20914.00 = 1682.60 FEET.
FLOW PROCESS FROM NODE 20914.00 TO NODE 20914.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 16.23
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.104
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fp
                                                   SCS
                                           Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 10

ELEVATION DATA: UPSTREAM(FEET) = 1780.00 DOWNSTREAM(FEET) = 1770.00

```
RESIDENTIAL.
 ".4 DWELLING/ACRE" B 8.27
                                    0.75
                                           0.900 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          0.58 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA(ACRES) = 8.85 SUBAREA RUNOFF(CFS) = 11.51
 EFFECTIVE AREA(ACRES) = 30.85 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 30.9 PEAK FLOW RATE (CFS) = 40.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
*****
 FLOW PROCESS FROM NODE 20914.00 TO NODE 20915.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1720.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 642.16 CHANNEL SLOPE = 0.0311
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.49 FLOW DEPTH (FEET) = 0.57
 TRAVEL TIME (MIN.) = 4.29 Tc (MIN.) = 20.52
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20915.00 = 2324.76 FEET.
FLOW PROCESS FROM NODE 20915.00 TO NODE 20915.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 20.52
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.828
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                         αA
                                                 SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   В 3.54
                                   0.75 0.900 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.59
                                         0.600 56
                                 0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
 SUBAREA AREA(ACRES) = 4.13
                           SUBAREA RUNOFF (CFS) = 4.41
 EFFECTIVE AREA(ACRES) = 34.98 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 35.0 PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
FLOW PROCESS FROM NODE 20915.00 TO NODE 20916.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

```
UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 STREET LENGTH (FEET) = 683.96 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    50.92
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.03
 STREET FLOW TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 22.60
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.725
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.86 0.75 0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 20.51 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.875
 SUBAREA AREA (ACRES) = 22.37 SUBAREA RUNOFF (CFS) = 21.54
 EFFECTIVE AREA(ACRES) = 57.35 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 57.3 PEAK FLOW RATE(CFS) = 55.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.31
 FLOW VELOCITY (FEET/SEC.) = 5.62 DEPTH*VELOCITY (FT*FT/SEC.) = 3.18
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 684.0 FT WITH ELEVATION-DROP = 20.0 FT, IS 39.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20916.00
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20916.00 = 3008.72 FEET.
******************
 FLOW PROCESS FROM NODE 20916.00 TO NODE 20917.00 IS CODE = 63
.....
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1672.00
 STREET LENGTH (FEET) = 576.79 CURB HEIGHT (INCHES) = 6.0
```

>>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014 File name: LR0209ZZ.RES Page 11

File name: LR0209ZZ.RES

Page 12

Date: 04/21/2014

```
STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.02
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.86
 STREET FLOW TRAVEL TIME (MIN.) = 1.37 Tc (MIN.) = 23.97
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.665
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FD AD SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.43 0.75
                                                  0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 16.04 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.847
 SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 18.07
 EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 76.8 PEAK FLOW RATE (CFS) =
                                                           70.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.19
 FLOW VELOCITY (FEET/SEC.) = 7.23 DEPTH*VELOCITY (FT*FT/SEC.) = 4.07
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20917.00 = 3585.51 FEET.
******************
 FLOW PROCESS FROM NODE 20917.00 TO NODE 20918.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1672.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 727.03 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 78.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.71
 STREET FLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 26.24
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.577
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               Дp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.63 0.75 0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 5.91 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 18.54 SUBAREA RUNOFF(CFS) = 17.63
 EFFECTIVE AREA(ACRES) = 95.36 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 95.4 PEAK FLOW RATE (CFS) =
                                                         81.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.71
 FLOW VELOCITY (FEET/SEC.) = 5.40 DEPTH*VELOCITY (FT*FT/SEC.) = 3.78
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20918.00 = 4312.54 FEET.
******************
 FLOW PROCESS FROM NODE 20918.00 TO NODE 20919.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 577.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   86.52
   ***STREET FLOWING FULL***
```

Page 14

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.72
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.01
 STREET FLOW TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 27.92
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.519
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.91 0.75 0.600
                                                         56
 AGRICULTURAL FAIR COVER
                         B 0.10 0.63 1.000 65
  "ORCHARDS"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
 SUBAREA AREA (ACRES) = 10.01 SUBAREA RUNOFF (CFS) = 9.63
 EFFECTIVE AREA(ACRES) = 105.37 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 105.4
                                 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.71
 FLOW VELOCITY (FEET/SEC.) = 5.71 DEPTH*VELOCITY (FT*FT/SEC.) = 4.00
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20919.00 = 4890.04 FEET.
******************
 FLOW PROCESS FROM NODE 20919.00 TO NODE 20920.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 1346.52 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 103.16
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 28.68
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.58
 STREET FLOW TRAVEL TIME (MIN.) = 3.53 Tc (MIN.) = 31.46
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.414
```

011D3DE3 1000 D3EE D3E3 /:						
SUBAREA LOSS RATE DATA (A			En	λn	909	
DEVELOPMENT TYPE/ LAND USE	CBUILD	(ACRES)	(TNCH/HR)	(DECIMAL)	CN	
RESIDENTIAL	01(001	(TICIND)	(INCII/III()	(DECIPIE)	CIV	
"3-4 DWELLINGS/ACRE"	В	4.53	0.75	0.600	56	
ACDICULTUDAL DATE COLUD						
"ORCHARDS"	В	10.24	0.63	1.000	65	
RESIDENTIAL						
".4 DWELLING/ACRE"	В	33.53	0.75	0.900	56	
SUBAREA AVERAGE PERVIOUS	S LOSS RA	TE, Fp(IN	CH/HR) =	0.72		
SUBAREA AVERAGE PERVIOUS	S AREA FR	ACTION, A	p = 0.893			
SUBAREA AREA(ACRES) =	48.30	SUBARE	A RUNOFF(C	FS) = 33.	53	
EFFECTIVE AREA(ACRES) =					= 0.62	
AREA-AVERAGED Fp (INCH/HI	R) = 0.7	4 AREA-A	VERAGED Ap	= 0.84		
TOTAL AREA (ACRES) =	153.7	PEA.	K FLOW RAT	E(CFS) =	109.97	
SUBAREA AREA-AVERAGED RA	ים דוגיקונדו	EDMII (TMCII)	١.			
5M = 0.36; 30M = 0.73;				= 2 27 • 24 #	P = 1 62	
3F1 = 0.30, 30F1 = 0.73,	Ink - 0.9	o, Jnk	1.05, 0116	- 2.27, 2411	N - 4.02	
END OF SUBAREA STREET FI	OW HYDRAI	ULICS:				
DEPTH (FEET) = 0.73 HAD			TH(FEET) =	29.29		
FLOW VELOCITY (FEET/SEC.)					= 4.76	
LONGEST FLOWPATH FROM NO						
*******	*****	*****	*****	******	******	
FLOW PROCESS FROM NODE				IS CODE =	1	
>>>>DESIGNATE INDEPENDENT						
>>>>AND COMPUTE VARIOUS		NCED SIKE	AM ANTOF2	((((		
TOTAL NUMBER OF STREAMS		=======	=======	=======	========	
TOTAL NUMBER OF STREAMS	= 2		======= REAM 2 AR	======= E•	=======	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED 1	= 2 FOR INDEP	ENDENT ST	====== REAM 2 AR	======= E:	=======	
TOTAL NUMBER OF STREAMS	= 2 FOR INDEP	ENDENT ST	====== REAM 2 AR	====== E:	======	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M:	= 2 FOR INDEPI IN.) = :: 'HR) = ::	ENDENT ST 31.46 1.41	======= REAM 2 AR	======= E:	=======	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH,	= 2 FOR INDEPI IN.) = 'HR) = 0.6	ENDENT ST 31.46 1.41 2	======= REAM 2 AR	======= E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED ITIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI	= 2 FOR INDEP IN.) = (HR) = R) = 0.6	ENDENT ST 31.46 1.41 2	======= REAM 2 AR	====== E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M: RAINFALL INTENSITY (INCH, AREA-AVERAGED FM (INCH/HI AREA-AVERAGED FD (INCH/HI AREA-AVERAGED AP = 0.80 EFFECTIVE STREAM AREA (AC	= 2 FOR INDEP! IN.) = (/HR) = (/HR) = (0.6) R) = 0.6 R) = 0.7	ENDENT ST 31.46 1.41 2 4		====== E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M: RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Fp (INCH/HI AREA-AVERAGED Ap = 0.80 EFFECTIVE STREAM AREA (ACTES)	= 2 FOR INDEP! IN.) = (/HR) = (R) = 0.6 R) = 0.7 ICRES) = 1	ENDENT ST 31.46 1.41 2 4 153.67		====== E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M: RAINFALL INTENSITY (INCH, AREA-AVERAGED FM (INCH/HI AREA-AVERAGED FD (INCH/HI AREA-AVERAGED AP = 0.80 EFFECTIVE STREAM AREA (AC	= 2 FOR INDEP! IN.) = (/HR) = (R) = 0.6 R) = 0.7 ICRES) = 1	ENDENT ST 31.46 1.41 2 4 153.67		====== E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M: RAINFALL INTENSITY (INCH, AREA-AVERAGED FM (INCH/HI AREA-AVERAGED FD (INCH/HI AREA-AVERAGED AP = 0.80 EFFECTIVE STREAM AREA (ACTUAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (	= 2 FOR INDEPI (IN.) = (HR) = (A) = 0.6 (A) = 0.7 (HR) = (CONFLUENCE)	ENDENT ST 31.46 1.41 2 4 153.67		====== E:		
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA **	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.6 (R) = 0.7 (CRES) = 1 (CONFLUENCE)	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1	09.97			
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA **	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.6 (R) = 0.7 (CRES) = 1 (CONFLUENCE)	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1	09.97		HEADWATER	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  Intens.	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1	09.97 Fm) Ap /HR)	Ae (ACRES)	HEADWATER NODE	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  Intens.	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1	09.97 Fm) Ap /HR)	Ae (ACRES)	HEADWATER NODE 20900.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA **	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  Intens.	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1	09.97 Fm) Ap /HR)	Ae (ACRES)	HEADWATER NODE 20900.00 20910.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22 2 109.97 31.4	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.6 R) = 0.7 R CRES) = 1 CONFLUENCE  Intens. (INCH/) 39 1.7 16 1.4	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH.) 34 0.75( 14 0.74(	09.97 Fm) Ap /HR) 0.56) 0.7 0.62) 0.8	Ae (ACRES)	HEADWATER NODE 20900.00 20910.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.6 R) = 0.7 R ERES) = 1 CONFLUENCE  Intens. (INCH/1) 1.4 FIME OF CO	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH, 34 0.75( 14 0.74(	09.97 Fm) Ap /HR) 0.56) 0.7 0.62) 0.8	Ae (ACRES)	HEADWATER NODE 20900.00 20910.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.84 EFFECTIVE STREAM AREA (AC TOTAL STREAM AREA (ACRES, PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.1 2 109.97 31.4	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.6 R) = 0.7 R ERES) = 1 CONFLUENCE  Intens. (INCH/1) 1.4 FIME OF CO	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH, 34 0.75( 14 0.74(	09.97 Fm) Ap /HR) 0.56) 0.7 0.62) 0.8	Ae (ACRES)	HEADWATER NODE 20900.00 20910.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Ap = 0.84 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND SCONFLUENCE FORMULA USED  ** PEAK FLOW RATE TABLE	= 2 FOR INDEP! (IN.) = (HR) = (HR) = 0.68 (R) = 0.79 (RES) = = 1. CONFLUENCE  Intens. (INCH/1) (INCH/1	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 10 ity Fp() HR) (INCH, 10 34 0.75 (14 0.74 (14 0.7	09.97 Fm) Ap /HR) 0.56) 0.7 0.62) 0.8 ION RATIO	Ae (ACRES) 5 102.8 4 153.7	20900.00 20910.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Fp (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (AC TOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND STONE CONFLUENCE FORMULA USED  ** PEAK FLOW RATE TABLE STREAM Q TC	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  INTERS. (INCH/1839 1.7 R FIME OF COUNTY OF	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH. 34 0.75( 14 0.74( ONCENTRAT: TREAMS.	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO	Ae (ACRES) 5 102.8 4 153.7	20900.00 20910.00 HEADWATER	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Fp (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (AC TOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND STREAM USED  ** PEAK FLOW RATE TABLE STREAM Q TC NUMBER (CFS) (MIN	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  INTERS.) (INCH/18 FOR 2 S'  ** Intens.) (INCH/19 INCH/19 I	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH. 34 0.75( 14 0.74( ONCENTRAT: TREAMS.	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO  Fm) Ap /HR)	Ae (ACRES) 5 102.8 4 153.7	20900.00 20910.00 HEADWATER NODE	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED ITIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED FM (INCH/HI AREA-AVERAGED AP = 0.84 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND CONFLUENCE FORMULA USED  ** PEAK FLOW RATE TABLE STREAM Q TC NUMBER (CFS) (MIN 1 218.05 22.3	= 2 FOR INDEP! (IN.) = (HR) = (HR) = 0.68 (R) = 0.79 (R	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(1 HR) (INCH, 34 0.75( ONCENTRAT: TREAMS. ity Fp(1 HR) (INCH, 34 0.74(	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO  Fm) Ap /HR) 0.59) 0.8	Ae (ACRES) 5 102.8 4 153.7 Ae (ACRES) 0 212.2	20900.00 20910.00 HEADWATER NODE 20900.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED Fp (INCH/HI AREA-AVERAGED Ap = 0.8 EFFECTIVE STREAM AREA (AC TOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND STONE CONFLUENCE FORMULA USED  ** PEAK FLOW RATE TABLE STREAM Q TC	= 2 FOR INDEP! (IN.) = (HR) = (HR) = 0.68 (R) = 0.79 (R	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(1 HR) (INCH, 34 0.75( ONCENTRAT: TREAMS. ity Fp(1 HR) (INCH, 34 0.74(	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO  Fm) Ap /HR) 0.59) 0.8	Ae (ACRES) 5 102.8 4 153.7 Ae (ACRES) 0 212.2	20900.00 20910.00 HEADWATER NODE 20900.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED I TIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED Fm (INCH/HI AREA-AVERAGED AP = 0.8 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND STREAM Q TC NUMBER (CFS) (MIN 1 218.05 22.3 2 188.63 31.4	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = 1 CONFLUENCE  INTERS.) (INCH/18 FOR 2 S'  ** Intens.) (INCH/18 1.4	ENDENT ST 31.46 1.41 2 4 153.67 53.67 E = 1 ity Fp(: HR) (INCH. 34 0.75( 14 0.74( CONCENTRAT: TREAMS. ity Fp(: HR) (INCH. 34 0.74( 14 0.74(	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO  Fm) Ap /HR) 0.59) 0.8 0.60) 0.8	Ae (ACRES) 5 102.8 4 153.7 Ae (ACRES) 0 212.2	20900.00 20910.00 HEADWATER NODE 20900.00	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED ITIME OF CONCENTRATION (M. RAINFALL INTENSITY (INCH, AREA-AVERAGED FM (INCH/HI AREA-AVERAGED AP = 0.84 EFFECTIVE STREAM AREA (ACTOTAL STREAM AREA (ACRES) PEAK FLOW RATE (CFS) AT (  ** CONFLUENCE DATA ** STREAM Q TC NUMBER (CFS) (MIN 1 108.27 22.3 2 109.97 31.4  RAINFALL INTENSITY AND CONFLUENCE FORMULA USED  ** PEAK FLOW RATE TABLE STREAM Q TC NUMBER (CFS) (MIN 1 218.05 22.3	= 2 FOR INDEP! (N.) = (HR) = (HR) = 0.60 R) = 0.7 R CRES) = = 1 CONFLUENCE  INTERS.) (INCH/18 FOR 2 S'  ** Intens.) (INCH/18 RIME OF CC FOR 2 S'  ** Intens.) (INCH/18 RIME OF CC FOR 2 S'  ** Intens.) (INCH/18 RIME OF CC FOR 2 S'  ** Intens.	ENDENT ST: 31.46 1.41 2 4 153.67 53.67 E = 1: ity Fp(: HR) (INCH: 34 0.75( 14 0.74(  CONCENTRAT: TREAMS. ity Fp(: HR) (INCH: 34 0.74(  CONCENTRAT: TREAMS.	09.97  Fm) Ap /HR) 0.56) 0.7 0.62) 0.8  ION RATIO  Fm) Ap /HR) 0.59) 0.8 0.60) 0.8  OWS:	Ae (ACRES) 5 102.8 4 153.7 Ae (ACRES) 0 212.2 0 256.5	20900.00 20910.00 HEADWATER NODE 20900.00	

Date: 04/21/2014

```
AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.80
                                                                               ** PEAK FLOW RATE TABLE **
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae
 TOTAL AREA (ACRES) = 256.5
                                                                                                                                  HEADWATER
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20920.00 = 6236.56 FEET.
                                                                               NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                          (ACRES) NODE
                                                                                       285.35 23.02 1.706 0.74(0.57) 0.77 279.9 20900.00
                                                                               1
2 238.61 32.11 1.397 0.74(0.58) 0.78 324.2 20910.00
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20921.00 IS CODE = 33
                                                                              NEW PEAK FLOW DATA ARE:
______
                                                                              PEAK FLOW RATE (CFS) = 285.35 Tc (MIN.) = 23.02
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                              AREA-AVERAGED Ap = 0.77 EFFECTIVE AREA(ACRES) = 279.88
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                              LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20921.00 = 7002.65 FEET.
_____
 UPSTREAM NODE ELEVATION (FEET) = 1600.00
                                                                             ************************
 DOWNSTREAM NODE ELEVATION (FEET) = 1580.00
 FLOW LENGTH (FEET) = 766.09 MANNING'S N = 0.013
                                                                              FLOW PROCESS FROM NODE 20921.00 TO NODE 20922.00 IS CODE = 42
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
                                                                              >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 31.6 INCHES
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.60
                                                                            ______
 PIPE-FLOW(CFS) = 218.05
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1580.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1560.00
 PIPEFLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 23.02
                                                                              FLOW LENGTH (FEET) = 1453.35 MANNING'S N = 0.013
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.706
                                                                              USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Αр
                                                     SCS
                                                                              DEPTH OF FLOW IN 75.0 INCH PIPE IS 38.2 INCHES
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              PIPE-FLOW VELOCITY (FEET/SEC.) = 18.19
 AGRICULTURAL FAIR COVER
                                                                              PIPE-FLOW(CFS) = 285.35
                             0.05
                                       0.63
                                               1.000
 "ORCHARDS"
                      В
                                                     65
                                                                              *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 RESIDENTIAL
                                                                              PIPEFLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 24.35
 "3-4 DWELLINGS/ACRE" B 11.48
                                       0.75
                                               0.600
                                                     56
                                                                              LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20922.00 = 8456.00 FEET.
 RESIDENTIAL
                                                                            *******************
                                              0.700
 "2 DWELLINGS/ACRE"
                     В
                             56.14
                                       0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              FLOW PROCESS FROM NODE 20922.00 TO NODE 20922.00 IS CODE = 81
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
                                                                             ______
 SUBAREA AREA(ACRES) = 67.67
                            SUBAREA RUNOFF (CFS) = 72.76
                                                                              >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 EFFECTIVE AREA(ACRES) = 279.88 AREA-AVERAGED Fm(INCH/HR) = 0.57
                                                                            ______
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.77
                                                                              MAINLINE Tc(MIN.) = 24.35
 TOTAL AREA(ACRES) = 324.2
                              PEAK FLOW RATE(CFS) =
                                                      285.35
                                                                              * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.649
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fρ
                                                                                                                            αA
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  LAND USE
                                                                              RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE" B 10.56
                                                                                                                    0.75
                                                                                                                            0.600
                                                                                                                                   56
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
                                                                              RESIDENTIAL
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                              "2 DWELLINGS/ACRE"
                                                                                                    B 31.42
                                                                                                                    0.75
                                                                                                                            0.700
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              RESIDENTIAL
                                                                              "5-7 DWELLINGS/ACRE"
                                                                                                    В 17.53
                                                                                                                    0.75
                                                                                                                            0.500
                                                                                                                                   56
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              MOBILE HOME PARK
                                                                                                    В 16.71
                                                                                                                    0.75
                                                                                                                            0.250
                                                                                                           2.07
                                                                                                                            0.100
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                              COMMERCIAL
                                                                                                    В
                                                                                                                    0.75
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.530
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              SUBAREA AREA(ACRES) = 78.29
                                                                                                           SUBAREA RUNOFF (CFS) = 88.27
                                                                              EFFECTIVE AREA(ACRES) = 358.17 AREA-AVERAGED Fm(INCH/HR) = 0.61
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 67.30
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.82
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              TOTAL AREA(ACRES) = 402.4
                                                                                                            PEAK FLOW RATE(CFS) =
                                                                                                                                  334.69
   STREET FLOW DEPTH(FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 24.86
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.28
                                                                              5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.46
```

EFFECTIVE AREA(ACRES) = 212.21 AREA-AVERAGED Fm(INCH/HR) = 0.59

Date: 04/21/2014 File name: LR0209ZZ.RES Page 17 Date: 04/21/2014 File name: LR0209ZZ.RES Page 18

```
** PEAK FLOW RATE TABLE **
                                                                               HALFSTREET FLOOD WIDTH (FEET) = 15.70
                Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                               AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.22
  STREAM
         0
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                               PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.30
    1
          358.27 24.44 1.646 0.74(0.53) 0.72 358.2 20900.00
    2
          295.62 33.59 1.360 0.74(0.54)0.73
                                              402.4 20910.00
                                                                              ** PEAK FLOW RATE TABLE **
 NEW PEAK FLOW DATA ARE:
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 PEAK FLOW RATE (CFS) = 358.27 Tc (MIN.) = 24.44
                                                                              NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                                       385.21 25.32 1.611 0.74(0.53) 0.71 394.2 20900.00
 AREA-AVERAGED Ap = 0.72 EFFECTIVE AREA(ACRES) =
                                                                                      316.93 34.51 1.338 0.74(0.53) 0.72 438.5 20910.00
                                                                              NEW PEAK FLOW DATA ARE:
******************
                                                                              PEAK FLOW RATE (CFS) = 385.21 Tc (MIN.) = 25.32
 FLOW PROCESS FROM NODE 20922.00 TO NODE 20923.00 IS CODE = 33
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                              AREA-AVERAGED Ap = 0.71 EFFECTIVE AREA(ACRES) = 394.21
                                                                              LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20923.00 = 9961.73 FEET.
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                            ******************
______
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
                                                                              FLOW PROCESS FROM NODE 20923.00 TO NODE 20924.00 IS CODE = 48
 DOWNSTREAM NODE ELEVATION (FEET) = 1490.00
 FLOW LENGTH (FEET) = 1505.73 MANNING'S N = 0.013
                                                                             >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                             >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
                                                                            ______
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.8 INCHES
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1440.00
 PIPE-FLOW VELOCITY(FEET/SEC.) = 30.32
                                                                             FLOW LENGTH (FEET) = 1358.44 MANNING'S N = 0.014
 PIPE-FLOW(CFS) = 358.27
                                                                             GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                             *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 4.83
 PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 25.32
                                                                              ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 19.93
                                                                              BOX-FLOW(CFS) =
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.611
                                                                                            385.21
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              BOX-FLOW TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 26.45
                                                                              LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20924.00 = 11320.17 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                                     SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            ******************
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 6.04
                                       0.75
                                              0.500
                                                    56
                                                                              FLOW PROCESS FROM NODE 20924.00 TO NODE 20924.00 IS CODE = 81
 RESIDENTIAL
                                                                            ______
 "3-4 DWELLINGS/ACRE" B 30.00
                                      0.75 0.600 56
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
                                                                             MAINLINE Tc(MIN.) = 26.45
                           SUBAREA RUNOFF(CFS) = 38.11
 SUBAREA AREA(ACRES) = 36.04
                                                                             * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.569
 EFFECTIVE AREA(ACRES) = 394.21 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fρ
                                                                                                                          αA
 TOTAL AREA(ACRES) = 438.5 PEAK FLOW RATE(CFS) = 385.21
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
                                                                              RESIDENTIAL
                                                                              "5-7 DWELLINGS/ACRE" B 6.19
                                                                                                                   0.75 0.500
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                                                                  56
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                              RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE"
                                                                                                 В 35.81
                                                                                                                   0.75 0.600
 STREET CROSS-SECTION INFORMATION:
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CURB HEIGHT (INCHES) = 6.0
                          STREET HALFWIDTH (FEET) = 18.00
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.585
                                                                              SUBAREA AREA (ACRES) = 42.00 SUBAREA RUNOFF (CFS) = 42.77
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              EFFECTIVE AREA(ACRES) = 436.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              TOTAL AREA (ACRES) = 480.5 PEAK FLOW RATE (CFS) = 413.12
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                            STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 26.94
                                                                              FLOW PROCESS FROM NODE 20924.00 TO NODE 20939.00 IS CODE = 48
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.44
                                                                             >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 19

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 20

```
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 1153.84 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 5.77
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.91
 BOX-FLOW(CFS) = 413.12
 BOX-FLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 27.53
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
*****************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 27.53
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                  В 2.86
                                           0.500 56
                                  0.75
 SCHOOL
                     в 0.48
                                    0.75
                                           0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.63 0.75
                                           0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.581
 SUBAREA AREA(ACRES) = 14.97 SUBAREA RUNOFF(CFS) = 14.79
 EFFECTIVE AREA(ACRES) = 451.18 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 495.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
********************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.53
 RAINFALL INTENSITY (INCH/HR) = 1.53
 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 451.18
 TOTAL STREAM AREA(ACRES) = 495.46
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 413.38
******************
 FLOW PROCESS FROM NODE 20930.00 TO NODE 20931.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
INITIAL SUBAREA FLOW-LENGTH (FEET) = 975.69
 ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 13.455
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.354
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                       SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.68 0.75 0.600 56 13.46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 14.88
 TOTAL AREA(ACRES) = 8.68 PEAK FLOW RATE(CFS) =
                                                 14.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
******************
 FLOW PROCESS FROM NODE 20931.00 TO NODE 20932.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 500.18 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 16.11
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.59
 STREET FLOW TRAVEL TIME (MIN.) = 2.12 Tc (MIN.) = 15.58
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.156
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.59 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 1.59 SUBAREA RUNOFF (CFS) = 2.44
 EFFECTIVE AREA(ACRES) = 10.27 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 10.3 PEAK FLOW RATE(CFS) = 15.78
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 21 Date: 04/21/2014 File name: LR0209ZZ.RES Page 22

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.82
 FLOW VELOCITY (FEET/SEC.) = 3.89 DEPTH*VELOCITY (FT*FT/SEC.) = 1.57
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20932.00 = 1475.87 FEET.
************************
 FLOW PROCESS FROM NODE 20932.00 TO NODE 20933.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1560.00
 STREET LENGTH (FEET) = 1367.05 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.68
 STREET FLOW TRAVEL TIME (MIN.) = 4.26 Tc (MIN.) = 19.84
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.865
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                       0.75 0.600 56
                     В 12.11
 SCHOOL
                       В 22.59
                                       0.75 0.600 56
                                       0.75 0.850 56
 PUBLIC PARK
                       в 1.47
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.610
 SUBAREA AREA(ACRES) = 36.17 SUBAREA RUNOFF(CFS) = 45.86
 EFFECTIVE AREA(ACRES) = 46.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 46.4 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.94
 FLOW VELOCITY (FEET/SEC.) = 6.20 DEPTH*VELOCITY (FT*FT/SEC.) = 3.47
```

```
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1367.1 FT WITH ELEVATION-DROP = 50.0 FT, IS 58.9 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20933.00
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20933.00 = 2842.92 FEET.
FLOW PROCESS FROM NODE 20933.00 TO NODE 20934.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1510.00
 FLOW LENGTH (FEET) = 1450.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 16.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.21
 PIPE-FLOW(CFS) =
                58.95
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 21.24
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20934.00 = 4292.92 FEET.
************************
 FLOW PROCESS FROM NODE 20934.00 TO NODE 20934.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 21.24
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                Fp
                                        Ар
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 26.74 0.75
                                        0.600
                                                56
 PUBLIC PARK
                     В
                          9.16
                                   0.75
                                         0.850
                                                56
                         6.76
                                   0.75
                                         0.600
                                                56
 SCHOOL
 AGRICULTURAL FAIR COVER
                     B 6.64
 "ORCHARDS"
                                   0.63 1.000
                                                65
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   в 2.77
                                   0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 52.07 SUBAREA RUNOFF (CFS) = 60.04
 EFFECTIVE AREA(ACRES) = 98.51 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 98.5
                            PEAK FLOW RATE(CFS) = 115.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
FLOW PROCESS FROM NODE 20934.00 TO NODE 20935.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1510.00
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 24

```
DOWNSTREAM NODE ELEVATION (FEET) = 1485.00
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LAND USE
 FLOW LENGTH (FEET) = 871.47 MANNING'S N = 0.013
                                                                         RESIDENTIAL
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                           В
                                                                                                   101.89
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
                                                                         COMMERCIAL
                                                                                            В
                                                                                                   1.19
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 22.0 INCHES
                                                                        MOBILE HOME PARK
                                                                                                   18.61
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.06
                                                                         RESIDENTIAL
                                                                                           B 2.78 0.75 0.500
 PIPE-FLOW(CFS) = 115.86
                                                                         "5-7 DWELLINGS/ACRE"
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 22.00
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.541
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20935.00 = 5164.39 FEET.
                                                                         SUBAREA AREA(ACRES) = 124.47
                                                                                                   SUBAREA RUNOFF (CFS) = 147.09
                                                                         EFFECTIVE AREA(ACRES) = 299.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
******************
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20935.00 IS CODE = 81
                                                                         TOTAL AREA (ACRES) =
                                                                                         299.0
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
______
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 MAINLINE Tc(MIN.) = 22.00
                                                                       ******************
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.753
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 20936.00 TO NODE 20937.00 IS CODE = 48
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                 ďΨ
                                                                       ______
                                                 SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                        >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 "3-4 DWELLINGS/ACRE" B 67.33
                                    0.75
                                           0.600
                                                 56
                                                                       _____
 AGRICULTURAL FAIR COVER
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1440.00
 "ORCHARDS"
                      В
                          8.70 0.63
                                         1.000
                                                                         FLOW LENGTH (FEET) = 712.54 MANNING'S N = 0.014
                                                                         GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                         *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 4.49
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
 SUBAREA AREA (ACRES) = 76.03
                           SUBAREA RUNOFF (CFS) = 87.80
                                                                        ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 19.03
 EFFECTIVE AREA(ACRES) = 174.54 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                         BOX-FLOW(CFS) =
                                                                                      341.90
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.65
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 23.38
 TOTAL AREA (ACRES) = 174.5 PEAK FLOW RATE (CFS) = 200.33
                                                                        LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20937.00 = 6676.03 FEET.
                                                                       ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                         FLOW PROCESS FROM NODE 20937.00 TO NODE 20937.00 IS CODE = 81
*******************
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                       _____
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20936.00 IS CODE = 48
                                                                         MAINLINE Tc(MIN.) = 23.38
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.690
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                         SUBAREA LOSS RATE DATA (AMC II):
_____
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
 ELEVATION DATA: UPSTREAM(FEET) = 1485.00 DOWNSTREAM(FEET) = 1465.00
                                                                           LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW LENGTH (FEET) = 799.10 MANNING'S N = 0.014
                                                                         RESIDENTIAL
 GIVEN BOX BASEWIDTH(FEET) = 3.00 GIVEN BOX HEIGHT(FEET) = 6.00
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                                   6.69
 FLOWDEPTH IN BOX IS 3.79 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 17.62
                                                                                                    28.27
                                                                         MOBILE HOME PARK
                                                                                            В
 BOX-FLOW(CFS) = 200.33
                                                                         COMMERCIAL
                                                                                             В
                                                                                                   1.13
 BOX-FLOW TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 22.76
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20936.00 = 5963.49 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.310
                                                                         SUBAREA AREA(ACRES) = 36.09
                                                                                                   SUBAREA RUNOFF (CFS) = 47.35
******************
                                                                         EFFECTIVE AREA(ACRES) = 335.10 AREA-AVERAGED Fm(INCH/HR) = 0.42
 FLOW PROCESS FROM NODE 20936.00 TO NODE 20936.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
._____
                                                                         TOTAL AREA (ACRES) =
                                                                                         335.1
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 22.76
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.717
                                                                       SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 SCS
```

FLOW PROCESS FROM NODE 20937.00 TO NODE 20938.00 IS CODE = 48 Date: 04/21/2014 File name: LR020977.RFS Page 26

Fp

0.75

0.75

0.75

PEAK FLOW RATE(CFS) =

Aр

0.600

0.250

0.100

56

381.81

0.75

0.75

PEAK FLOW RATE(CFS) =

0.75

0.600

0.100

0.250

56

56

56

341.90

```
_____
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                           MAINLINE Tc (MIN.) = 25.29
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                           * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.612
SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1415.00
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                       Αp
                                                                             LAND USE
 FLOW LENGTH (FEET) = 983.49 MANNING'S N = 0.014
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                           RESIDENTIAL.
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 5.54
                                                                           "5-7 DWELLINGS/ACRE" B 6.87
                                                                                                                0.75
                                                                                                                       0.500
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.24
                                                                           RESIDENTIAL
                                                                                             B 0.91
                                                                                                                0.75 0.600
 BOX-FLOW(CFS) =
               381.81
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                               B 3.23 0.75 0.600
 BOX-FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 24.33
                                                                           SCHOOL
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20938.00 = 7659.52 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.538
******************
                                                                           SUBAREA AREA(ACRES) = 11.01
                                                                                                       SUBAREA RUNOFF (CFS) = 11.99
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20938.00 IS CODE = 81
                                                                           EFFECTIVE AREA(ACRES) = 411.05 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           TOTAL AREA (ACRES) = 411.1 PEAK FLOW RATE (CFS) = 448.86
______
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 MAINLINE Tc(MIN.) = 24.33
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.650
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                          ******************
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     в 3.30 0.75
                                             0.100
                                                                           FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 20.77
                                     0.75
                                             0.600
                                                    56
                                                                           >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 RESIDENTIAL
                                                                           >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 "5-7 DWELLINGS/ACRE"
                   В 10.89
                                     0.75
                                             0.500
                                                   56
                                                                         _____
                             29.98
                                                                           TOTAL NUMBER OF STREAMS = 2
 MOBILE HOME PARK
                      В
                                     0.75
                                             0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.396
                                                                           TIME OF CONCENTRATION (MIN.) = 25.29
 SUBAREA AREA(ACRES) = 64.94
                             SUBAREA RUNOFF (CFS) = 79.10
                                                                           RAINFALL INTENSITY (INCH/HR) = 1.61
 EFFECTIVE AREA(ACRES) = 400.04 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.74
 TOTAL AREA (ACRES) = 400.0 PEAK FLOW RATE (CFS) =
                                                 448.86
                                                                           AREA-AVERAGED Ap = 0.54
                                                                           EFFECTIVE STREAM AREA(ACRES) = 411.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           TOTAL STREAM AREA(ACRES) = 411.05
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE = 448.86
*********************
                                                                           ** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20939.00 IS CODE = 48
                                                                                   Q Tc Intensity Fp(Fm) Ap Ae
                                                                            NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                      (ACRES) NODE
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                             1
                                                                                    413.38 27.53 1.532 0.75(0.51) 0.69 451.2 20900.00
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                                    340.37 36.82 1.287 0.74 (0.52) 0.70 495.5 20910.00
_____
                                                                                    448.86 25.29 1.612 0.74(0.40) 0.54 411.1 20930.00
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 668.85 MANNING'S N = 0.014
                                                                           RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                           CONFLUENCE FORMULA USED FOR 2 STREAMS.
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 9.62
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 11.67
                                                                           ** PEAK FLOW RATE TABLE **
 BOX-FLOW(CFS) = 448.86
                                                                            STREAM
                                                                                    0
                                                                                          Tc Intensity Fp(Fm)
                                                                                                                Ap Ae
 BOX-FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 25.29
                                                                            NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                      (ACRES) NODE
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20939.00 = 8328.37 FEET.
                                                                            1
                                                                                    858.47 25.29 1.612 0.74(0.46) 0.62 825.5 20930.00
                                                                                    832.55 27.53 1.532 0.74(0.46) 0.62
                                                                                                                      862.2 20900.00
3
                                                                                    668.45 36.82 1.287 0.74(0.47) 0.63 906.5 20910.00
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           PEAK FLOW RATE (CFS) = 858.47 Tc (MIN.) = 25.29
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 27 56

HEADWATER

HEADWATER

Page 28

```
EFFECTIVE AREA(ACRES) = 825.54 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 906.5
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 71
_____
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
_____
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.27;24H= 4.63
 S-GRAPH: VALLEY (DEV.) = 81.6%; VALLEY (UNDEV.) / DESERT= 18.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.47; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 906.5
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0449; Lca/L=0.4,n=.0403; Lca/L=0.5,n=.0370; Lca/L=0.6,n=.0345
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 176.20
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 748.57
 TOTAL PEAK FLOW RATE (CFS) = 748.57 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 858.47
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 858.47)
 PEAK FLOW RATE (CFS) USED = 858.47
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20940.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1409.00 DOWNSTREAM(FEET) = 1370.00
 FLOW LENGTH (FEET) = 2606.42 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 13.43
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.97
 BOX-FLOW(CFS) = 858.47
 BOX-FLOW TRAVEL TIME (MIN.) = 2.72 Tc (MIN.) = 39.54
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
*******************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 39.54
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.233
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Ap SCS
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                            57.18
                                    0.75
                                            0.600
                                                  56
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE"
                            27.41
                                     0.75
                                            0.600 56
                                                                               Date: 04/21/2014
```

```
В
                         4.75 0.75 0.250
 MOBILE HOME PARK
                                                56
                     В
                           4.99
                                   0.75 0.100
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556
 SUBAREA AREA(ACRES) = 94.33
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.27;24H= 4.62
 S-GRAPH: VALLEY(DEV.) = 83.3%; VALLEY(UNDEV.) / DESERT= 16.7%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.46; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1000.8
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0410; Lca/L=0.4,n=.0367; Lca/L=0.5,n=.0337; Lca/L=0.6,n=.0315
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 196.20
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 806.95
 TOTAL AREA(ACRES) = 1000.8
                            PEAK FLOW RATE(CFS) =
                                                858.47
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
*******************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20852.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2033.20 Tc (MIN.) = 42.52
 AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.54
 TOTAL AREA (ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2033.20 Tc (MIN.) = 42.52
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.54
 TOTAL AREA (ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 12
```

File name: LR0209ZZ.RES

Page 30

Date: 04/21/2014 File name: LR020977.RFS Page 29

```
FLOW PROCESS FROM NODE 20940.00 TO NODE 20955.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1360.00
 FLOW LENGTH (FEET) = 618.86 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 16.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 5.36 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 29.33
 BOX-FLOW(CFS) = 2515.15
 BOX-FLOW TRAVEL TIME (MIN.) = 0.35 Tc (MIN.) = 43.99
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 2515.15 Tc (MIN.) = 43.99
 AREA-AVERAGED Fm (INCH/HR) = 0.48 Ybar = 0.54
 TOTAL AREA (ACRES) =
                    3993.8
******************
 FLOW PROCESS FROM NODE 20950.00 TO NODE 20951.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 667.18
 ELEVATION DATA: UPSTREAM(FEET) = 1438.00 DOWNSTREAM(FEET) = 1417.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.046
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.987
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                                    SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
                                             0.250
 MOBILE HOME PARK
                              4.45
                                      0.75
                                                        9.05
                     В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                            1.19
                                      0.75
                                             0.600
                                                    56 11.09
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
 SUBAREA RUNOFF(CFS) = 13.93
 TOTAL AREA (ACRES) = 5.64 PEAK FLOW RATE (CFS) =
                                               13.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
******************
 FLOW PROCESS FROM NODE 20951.00 TO NODE 20952.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 1417.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 191.07
```

Date: 04/21/2014

```
"V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.895
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              qΑ
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             0.46
                                        0.75
                    В
                                                0.600
 MOBILE HOME PARK
                     В
                             2.56
                                       0.75
                                                0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.303
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.57
 AVERAGE FLOW DEPTH(FEET) = 0.51 FLOOD WIDTH(FEET) = 21.89
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 9.53
 SUBAREA AREA(ACRES) = 3.02
                               SUBAREA RUNOFF (CFS) = 7.25
 EFFECTIVE AREA(ACRES) = 8.66 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA(ACRES) = 8.7 PEAK FLOW RATE(CFS) =
                                                         20.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.53 FLOOD WIDTH(FEET) = 24.28
 FLOW VELOCITY (FEET/SEC.) = 6.59 DEPTH*VELOCITY (FT*FT/SEC) = 3.50
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20952.00 = 858.25 FEET.
******************
 FLOW PROCESS FROM NODE 20952.00 TO NODE 20953.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1409.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1404.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 204.94
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.782
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Ар
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                               1.20
                                        0.75
                                                0.600
                                                      56
                    В
 MOBILE HOME PARK
                      В
                               1.83
                                        0.75
                                                0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.389
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.12
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.19
 AVERAGE FLOW DEPTH(FEET) = 0.59 FLOOD WIDTH(FEET) = 30.71
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.66 Tc (MIN.) = 10.19
 SUBAREA AREA(ACRES) = 3.03 SUBAREA RUNOFF(CFS) = 6.79
 EFFECTIVE AREA(ACRES) = 11.69 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.60 FLOOD WIDTH (FEET) = 32.20
 FLOW VELOCITY (FEET/SEC.) = 5.28 DEPTH*VELOCITY (FT*FT/SEC) = 3.16
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20953.00 = 1063.19 FEET.
******************
 FLOW PROCESS FROM NODE 20953.00 TO NODE 20954.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1404.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1400.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 260.93
 "V" GUTTER WIDTH(FEET) = 3.00 GUTTER HIKE(FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.631
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.52 0.75
                                               0.600
                                                       56
                             0.19 0.75
                                               0.250
 MOBILE HOME PARK
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 30.29
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.40
 AVERAGE FLOW DEPTH (FEET) = 0.65 FLOOD WIDTH (FEET) = 38.32
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 11.18
 SUBAREA AREA(ACRES) = 3.71
                               SUBAREA RUNOFF (CFS) = 7.33
 EFFECTIVE AREA(ACRES) = 15.40 AREA-AVERAGED Fm(INCH/HR) = 0.30
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA(ACRES) = 15.4
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.66 FLOOD WIDTH (FEET) = 39.52
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC) = 2.94
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20954.00 = 1324.12 FEET.
FLOW PROCESS FROM NODE 20954.00 TO NODE 20955.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1400.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1360.00
 FLOW LENGTH (FEET) = 1961.31 MANNING'S N = 0.013
```

TOTAL AREA (ACRES) = 11.7 PEAK FLOW RATE (CFS) =

Date: 04/21/2014 File name: LR0209ZZ.RES Page 33

File name: LR020977.RFS

Date: 04/21/2014

Page 34

26.63

```
USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 84.0 INCH PIPE IS 10.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.15
 PIPE-FLOW(CFS) = 32.38
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.93 Tc (MIN.) = 14.11
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20955.00 = 3285.43 FEET.
FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 14.11
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.288
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Ap SCS
                                  Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 PUBLIC PARK
                     В
                             0.07
                                     0.75
                                            0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                             7.87
                                     0.75
                                            0.600 56
 MOBILE HOME PARK
                    В
                           1.54
                                     0.75
                                            0.250 56
 COMMERCIAL
                      В
                             9.50
                                     0.75
                                            0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.322
 SUBAREA AREA(ACRES) = 18.98
                            SUBAREA RUNOFF (CFS) = 34.97
 EFFECTIVE AREA(ACRES) = 34.38 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.35
 TOTAL AREA (ACRES) = 34.4
                            PEAK FLOW RATE(CFS) =
                                                    62.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
*****************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
 ______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.11
 RAINFALL INTENSITY (INCH/HR) = 2.29
 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 34.38
                        34.38
 TOTAL STREAM AREA (ACRES) =
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               62.59
 ** CONFLUENCE DATA **
                        AREA
                                HEADWATER
 STREAM
        O Tc
 NUMBER (CFS) (MIN.) (ACRES)
                                 NODE
   1 2515.15 43.99 3993.76 20620.00
         62.59 14.11 34.38 20950.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.80
```

```
S-GRAPH: VALLEY(DEV.) = 90.2%; VALLEY(UNDEV.) / DESERT = 9.8%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.73; LAG(HR) = 0.59; Fm(INCH/HR) = 0.48; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4028.1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0293; Lca/L=0.4, n=.0262; Lca/L=0.5, n=.0241; Lca/L=0.6, n=.0225
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 784.68
 PEAK FLOW RATE (CFS) = 2538.04
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 15.1
______
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20539.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3223.65 Tc (MIN.) = 50.28
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
************************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3223.65 Tc (MIN.) = 50.28
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
 TOTAL AREA(ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
*******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
*******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20955.00 IS CODE = 54
._____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1366.00 DOWNSTREAM(FEET) = 1360.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 385.80 CHANNEL SLOPE = 0.0156
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 35 Date: 04/21/2014 File name: LR0209ZZ.RES Page 36

```
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
 CHANNEL FLOW THRU SUBAREA(CFS) = 3223.65
 FLOW VELOCITY (FEET/SEC.) = 27.50 FLOW DEPTH (FEET) = 5.22
 TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 50.51
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
*******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 11
_____
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 3223.65 Tc (MIN.) = 50.51
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.56
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 2538.04 Tc (MIN.) = 43.99
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.54
 TOTAL AREA(ACRES) = 4028.1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.47;24H= 5.39
 S-GRAPH: VALLEY(DEV.) = 68.9%; VALLEY(UNDEV.) / DESERT = 31.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.52; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10026.4
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0301; Lca/L=0.4, n=.0270; Lca/L=0.5, n=.0248; Lca/L=0.6, n=.0231
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2062.35
 PEAK FLOW RATE (CFS) = 4727.25
*****************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20956.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1360.00 DOWNSTREAM(FEET) = 1350.00
 FLOW LENGTH (FEET) = 666.58 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 6.23 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 32.99
 BOX-FLOW(CFS) = 4727.25
 BOX-FLOW TRAVEL TIME (MIN.) = 0.34 Tc (MIN.) = 50.85
```

```
*******************
 FLOW PROCESS FROM NODE 20956.00 TO NODE 20956.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 50.85
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.060
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                   SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                            5.80
                                     0.75
                                             0.600
                                                    56
 COMMERCIAL
                      В
                            17.13
                                     0.75
                                             0.100
                                                    56
                             0.39
 PUBLIC PARK
                     В
                                     0.75
                                             0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.237
 SUBAREA AREA(ACRES) = 23.32
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.47;24H= 5.39
 S-GRAPH: VALLEY(DEV.) = 69.0%; VALLEY(UNDEV.) / DESERT = 31.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.85; LAG(HR) = 0.68; Fm(INCH/HR) = 0.52; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10049.7
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0298; Lca/L=0.4,n=.0267; Lca/L=0.5,n=.0245; Lca/L=0.6,n=.0229
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2069.32
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 4745.28
 TOTAL AREA (ACRES) = 10049.7 PEAK FLOW RATE (CFS) = 4745.28
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
******************
 FLOW PROCESS FROM NODE 20956.00 TO NODE 20968.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1335.00
 FLOW LENGTH (FEET) = 926.11 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 6.08 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 33.91
 BOX-FLOW(CFS) = 4745.28
 BOX-FLOW TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 51.30
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 51.30
```

File name: LR020977.RFS

Page 38

Date: 04/21/2014

Date: 04/21/2014 File name: LR020977.RFS Page 37

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.055
                                                                                RESIDENTIAL.
                                                                                "3-4 DWELLINGS/ACRE" B 0.91 0.75 0.600 56 13.72
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.296
 RESIDENTIAL
                                                                                SUBAREA RUNOFF(CFS) = 20.34
 "3-4 DWELLINGS/ACRE" B 2.51
                                     0.75 0.600 56
                                                                                TOTAL AREA (ACRES) = 8.79 PEAK FLOW RATE (CFS) = 20.34
                      B 3.07 0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 SUBAREA AREA (ACRES) = 5.58
                                                                               ******************
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.47;24H= 5.39
                                                                                FLOW PROCESS FROM NODE 20961.00 TO NODE 20962.00 IS CODE = 63
 S-GRAPH: VALLEY (DEV.) = 69.0%; VALLEY (UNDEV.) / DESERT= 31.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 Tc(HR) = 0.86; LAG(HR) = 0.68; Fm(INCH/HR) = 0.52; Ybar = 0.55
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                               ______
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
                                                                                UPSTREAM ELEVATION(FEET) = 1360.00 DOWNSTREAM ELEVATION(FEET) = 1359.00
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                                STREET LENGTH (FEET) = 280.72 CURB HEIGHT (INCHES) = 6.0
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10055.3
                                                                                STREET HALFWIDTH (FEET) = 18.00
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
  Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242; Lca/L=0.6,n=.0226
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2070.83
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 4747.98
 TOTAL AREA (ACRES) = 10055.3 PEAK FLOW RATE (CFS) = 4747.98
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
                                                                                                                                  24.70
                                                                                  ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
______
                                                                                  STREET FLOW DEPTH (FEET) = 0.61
 TOTAL NUMBER OF STREAMS = 2
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 23.32
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.13
 PEAK FLOW RATE (CFS) = 4747.98 Tc (MIN.) = 51.30
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.29
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.55
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.20 Tc (MIN.) = 12.32
 TOTAL AREA(ACRES) = 10055.3
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.482
                                                                                SUBAREA LOSS RATE DATA (AMC II):
*******************
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fρ
                                                                                                                               Aр
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 20960.00 TO NODE 20961.00 IS CODE = 21
                                                                                    LAND USE
                                                                                RESIDENTIAL
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                "5-7 DWELLINGS/ACRE"
                                                                                                    В 1.51
                                                                                                                       0.75
                                                                                                                               0.500
                                                                                                       В 2.33
                                                                                                                       0.75
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                COMMERCIAL
                                                                                                                               0.100
______
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 0.44
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 935.10
                                                                                                                       0.75
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1360.00
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.293
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                                SUBAREA AREA(ACRES) = 4.28 SUBAREA RUNOFF(CFS) = 8.72
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120
                                                                                EFFECTIVE AREA(ACRES) = 13.07 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.793
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                                TOTAL AREA (ACRES) = 13.1 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                               Ap SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                             3.18
                                        0.75
                                                0.500 56 12.95
 COMMERCIAL
                       В
                               4.70
                                        0.75
                                                0.100 56 10.12
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Date: 04/21/2014 File name: LR0209ZZ.RES 56

26.60

Page 40

```
DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.99
 FLOW VELOCITY (FEET/SEC.) = 2.17 DEPTH*VELOCITY (FT*FT/SEC.) = 1.35
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20962.00 = 1215.82 FEET.
*****************
 FLOW PROCESS FROM NODE 20962.00 TO NODE 20963.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1359.00 DOWNSTREAM ELEVATION(FEET) = 1358.50
 STREET LENGTH (FEET) = 189.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.02
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.36
 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 13.88
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.310
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     B 1.24
                                         0.75
                                                 0.500 56
                       B 1.91
 COMMERCIAL
                                         0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.309
 SUBAREA AREA (ACRES) = 3.71 SUBAREA RUNOFF (CFS) = 6.94
 EFFECTIVE AREA(ACRES) = 16.78 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 16.8 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.11
 FLOW VELOCITY (FEET/SEC.) = 2.04 DEPTH*VELOCITY (FT*FT/SEC.) = 1.39
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20963.00 = 1404.92 FEET.
FLOW PROCESS FROM NODE 20963.00 TO NODE 20964.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1358.50 DOWNSTREAM ELEVATION(FEET) = 1358.00
 STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 28.51
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.45
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 15.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.160
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 1.22 COMMERCIAL B 1.94
                                        0.75
                                                0.500
                                                       56
                                        0.75
                                                0.100
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.298
 SUBAREA AREA(ACRES) = 3.61 SUBAREA RUNOFF(CFS) = 6.30
 EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 35.55
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.75
 FLOW VELOCITY (FEET/SEC.) = 2.06 DEPTH*VELOCITY (FT*FT/SEC.) = 1.47
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20964.00 = 1606.51 FEET.
*****************
 FLOW PROCESS FROM NODE 20964.00 TO NODE 20965.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1358.00 DOWNSTREAM ELEVATION(FEET) = 1357.50
 STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 41 Date: 04/21/2014 File name: LR0209ZZ.RES

UPSTREAM ELEVATION(FEET) = 1357.50 DOWNSTREAM ELEVATION(FEET) = 1357.00 STREET LENGTH(FEET) = 207.50 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    42.87
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.76
   HALFSTREET FLOOD WIDTH (FEET) = 31.13
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.62
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 18.75
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.929
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 0.74
                                         0.98 0.500
                                                          32
 COMMERCIAL
                       В
                              0.93 0.75 0.100 56
                                 2.70
 COMMERCIAL
                        В
                                         0.75 0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.168
 SUBAREA AREA(ACRES) = 4.37 SUBAREA RUNOFF(CFS) = 7.02
 EFFECTIVE AREA(ACRES) = 28.59 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.29
 TOTAL AREA(ACRES) = 28.6 PEAK FLOW RATE(CFS) =
                                                           44.03
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.44
 FLOW VELOCITY (FEET/SEC.) = 2.15 DEPTH*VELOCITY (FT*FT/SEC.) = 1.65
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 207.5 FT WITH ELEVATION-DROP = 0.5 FT, IS 11.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20966.00
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20966.00 = 2015.60 FEET.
*******************
 FLOW PROCESS FROM NODE 20966.00 TO NODE 20967.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1357.00 DOWNSTREAM ELEVATION(FEET) = 1356.00
 STREET LENGTH (FEET) = 341.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

File name: LR0209ZZ.RES

Page 44

Date: 04/21/2014

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 31.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.82
 STREET FLOW TRAVEL TIME (MIN.) = 2.40 Tc (MIN.) = 21.16
  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.794
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                         Fр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 2.02
                                          0.98
                                                  0.500
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     В 0.32
                                          0.75
                                                  0.500 56
 COMMERCIAL
                         A
                                 0.04
                                          0.98
                                                  0.100
 COMMERCIAL
                       В
                                 4.03
                                          0.75
                                                  0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
 SUBAREA AREA(ACRES) = 6.41
                               SUBAREA RUNOFF (CFS) = 9.08
 EFFECTIVE AREA(ACRES) = 35.00 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) = 35.0 PEAK FLOW RATE (CFS) =
                                                           49.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.74
 FLOW VELOCITY (FEET/SEC.) = 2.38 DEPTH*VELOCITY (FT*FT/SEC.) = 1.84
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 341.5 FT WITH ELEVATION-DROP = 1.0 FT, IS 14.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20967.00
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20967.00 = 2357.15 FEET.
*****************
 FLOW PROCESS FROM NODE 20967.00 TO NODE 20968.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1356.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1335.00
 FLOW LENGTH (FEET) = 1730.15 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 19.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 11.20
 PIPE-FLOW(CFS) = 49.65
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.73 Tc (MIN.) = 23.89
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.668
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fр
                                                        SCS
                                                  Aр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                               13.57 0.75
                                                 0.100
 RESTDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.04 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192
 SUBAREA AREA(ACRES) = 16.61 SUBAREA RUNOFF(CFS) = 22.79
 EFFECTIVE AREA(ACRES) = 51.61 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.25
 TOTAL AREA(ACRES) = 51.6 PEAK FLOW RATE(CFS) =
                                                          68.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                           STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 18.82
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 17.47
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.47
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20968.00 = 4087.30 FEET.
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 23.89
 RAINFALL INTENSITY (INCH/HR) = 1.67
 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.77
 AREA-AVERAGED Ap = 0.25
 EFFECTIVE STREAM AREA(ACRES) = 51.61
 TOTAL STREAM AREA(ACRES) = 51.61
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 68.47
 ** CONFLUENCE DATA **
                        AREA
                                   HEADWATER
 STREAM
        0
                 Tc
 NUMBER (CFS) (MIN.) (ACRES) NODE
  1 4747.98 51.30 10055.32 20120.00
  2 68.47 23.89 51.61 20960.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
```

File name: LR0209ZZ.RES

Page 46

Date: 04/21/2014

RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.47;24H= 5.39 S-GRAPH: VALLEY (DEV.) = 69.1%; VALLEY (UNDEV.) / DESERT= 30.9% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.86; LAG(HR) = 0.68; Fm(INCH/HR) = 0.52; Ybar = 0.55 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68; 3HR = 0.94; 6HR = 0.97; 24HR = 0.98UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10106.9 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242; Lca/L=0.6,n=.0226 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2085.88 PEAK FLOW RATE (CFS) = 4775.17\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 152 \_\_\_\_\_\_ >>>>STORE PEAK FLOWRATE TABLE TO A FILE< \_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 20968.DNA \_\_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 10106.9 TC (MIN.) = 51.30 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.55PEAK FLOW RATE (CFS) = 4775.17\_\_\_\_\_\_ \_\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0209ZZ.RES Page 47 Date: 04/21/2014 File name: LR0209ZZ.RES Page 48

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21070

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0210ZZ.DAT

TIME/DATE OF STUDY: 08:04 11/19/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGY AND HIDRAULIC MODEL INFORMATION.

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	==========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

```
17 20.0
           10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180
18 26.0
            15.0
                   0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
19 52.0
            20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180
 GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
  1. Relative Flow-Depth = 0.20 FEET
     as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
   2. (Depth) * (Velocity) Constraint = 6.0 (FT*FT/S)
 *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
  OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
 *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED
 UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
   WATERSHED LAG = 0.80 * Tc
   USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF
   1 UNITS/ACRE AND LESS: AND "VALLEY DEVELOPED" S-GRAPH
   FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE.
   PRECIPITATION DATA ENTERED ON SUBAREA BASIS.
   SIERRA MADRE DEPTH-AREA FACTORS USED.
*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*
*******************
 FLOW PROCESS FROM NODE 21000.00 TO NODE 21001.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 690.87
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1518.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.815
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.545
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
                              5.92 0.75 0.600
 "3-4 DWELLINGS/ACRE" B
                                                        56 11.82
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 11.17
 TOTAL AREA(ACRES) = 5.92 PEAK FLOW RATE(CFS) =
                                                 11 17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 201001.00 TO NODE 201002.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1480.00
 STREET LENGTH (FEET) = 646.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
       Date: 04/21/2014
                        File name: LR0210ZZ.RES
                                                       Page 2
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.39
   HALFSTREET FLOOD WIDTH (FEET) = 12.96
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.03
 STREET FLOW TRAVEL TIME (MIN.) = 2.05 Tc (MIN.) = 13.87
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.312
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            9.22
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.22
                             SUBAREA RUNOFF (CFS) = 15.46
 EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                      25.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.60
 FLOW VELOCITY (FEET/SEC.) = 5.64 DEPTH*VELOCITY (FT*FT/SEC.) = 2.36
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 201002.00 = 1337.47 FEET.
FLOW PROCESS FROM NODE 21002.00 TO NODE 21013.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1433.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1375.46 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 25.39
 FLOW VELOCITY (FEET/SEC.) = 5.72 FLOW DEPTH (FEET) = 0.92
 TRAVEL TIME (MIN.) = 4.01 Tc (MIN.) = 17.88
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.
*****************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 17.88
```

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.985
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.03 0.75 0.600
                                                   56
                           7.98 0.75 0.600 56
 SCHOOT.
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 15.01 SUBAREA RUNOFF (CFS) = 20.75
 EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 30.2
                              PEAK FLOW RATE(CFS) =
                                                 41.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
************************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.88
 RAINFALL INTENSITY (INCH/HR) = 1.99
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 30.15
 TOTAL STREAM AREA(ACRES) = 30.15
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                41.69
******************
 FLOW PROCESS FROM NODE 21010.00 TO NODE 21011.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.60
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1462.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.628
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.445
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           Ар
                                                  SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 7.05 0.75 0.600
                                                 56 12.63
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 12.67
 TOTAL AREA (ACRES) = 7.05 PEAK FLOW RATE (CFS) = 12.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 3 Date: 04/21/2014 File name: LR0210ZZ.RES Page 4

```
******************
 FLOW PROCESS FROM NODE 21011.00 TO NODE 21012.00 IS CODE = 63
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1462.00 DOWNSTREAM ELEVATION(FEET) = 1440.00
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 809.73 CURB HEIGHT (INCHES) = 6.0
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                               20.52
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                STREET FLOW DEPTH (FEET) = 0.45
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 16.24
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.72
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.68
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 17.58
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                               * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.005
                                                                               SUBAREA LOSS RATE DATA (AMC II):
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.76
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                                   SCS
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.42
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" B 0.66 0.75 0.600 56
   HALFSTREET FLOOD WIDTH (FEET) = 14.45
                                                                                                   B 1.95 0.75 0.600 56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.58
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 3.55 Tc (MIN.) = 16.18
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.108
                                                                               SUBAREA AREA (ACRES) = 2.61 SUBAREA RUNOFF (CFS) = 3.66
                                                                               EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.45
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP SCS
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                               TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) = 21.20
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             4.37
                                       0.75 0.600 56
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SCHOOL
                      В
                             1.10 0.75 0.600 56
                                                                               5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 5.47 SUBAREA RUNOFF (CFS) = 8.17
                                                                               DEPTH (FEET) = 0.46 HALFSTREET FLOOD WIDTH (FEET) = 16.48
 EFFECTIVE AREA(ACRES) = 12.52 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                               FLOW VELOCITY (FEET/SEC.) = 3.74 DEPTH*VELOCITY (FT*FT/SEC.) = 1.71
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                               LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21013.00 = 2033.40 FEET.
 TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) =
                                                       18.69
                                                                             *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.07
                                                                             ______
 FLOW VELOCITY (FEET/SEC.) = 3.91 DEPTH*VELOCITY (FT*FT/SEC.) = 1.67
                                                                               TOTAL NUMBER OF STREAMS = 2
 LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21012.00 = 1721.33 FEET.
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                               TIME OF CONCENTRATION (MIN.) = 17.58
******************
                                                                               RAINFALL INTENSITY (INCH/HR) = 2.01
 FLOW PROCESS FROM NODE 21012.00 TO NODE 21013.00 IS CODE = 63
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.45
______
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               AREA-AVERAGED Ap = 0.60
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               EFFECTIVE STREAM AREA(ACRES) = 15.13
______
                                                                               TOTAL STREAM AREA(ACRES) = 15.13
 UPSTREAM ELEVATION(FEET) = 1440.00 DOWNSTREAM ELEVATION(FEET) = 1433.00
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE =
 STREET LENGTH (FEET) = 312.07 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                               ** CONFLUENCE DATA **
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 5

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 6

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 41.69 17.88 1.985 0.75(0.45) 0.60 30.2 21000.00  2 21.20 17.58 2.005 0.75(0.45) 0.60 15.1 21010.00  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.	COMMERCIAL B 2.09 0.75 0.100 56  MOBILE HOME PARK B 0.23 0.75 0.250 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548  SUBAREA AREA(ACRES) = 21.79 SUBAREA RUNOFF(CFS) = 27.31  EFFECTIVE AREA(ACRES) = 66.56 AREA-AVERAGED Fm(INCH/HR) = 0.44  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58  TOTAL AREA(ACRES) = 67.1 PEAK FLOW RATE(CFS) = 81.86
** PEAK FLOW RATE TABLE **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 62.73 17.58 2.005 0.75(0.45) 0.60 44.8 21010.00  2 62.61 17.88 1.985 0.75(0.45) 0.60 45.3 21000.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26  ***********************************
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE(CFS) = 62.73 Tc(MIN.) = 17.58  EFFECTIVE AREA(ACRES) = 44.77 AREA-AVERAGED Fm(INCH/HR) = 0.45  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
TOTAL AREA (ACRES) = 45.3  LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.	UPSTREAM ELEVATION(FEET) = 1380.00 DOWNSTREAM ELEVATION(FEET) = 1345.00 STREET LENGTH(FEET) = 1339.49 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
FLOW PROCESS FROM NODE 21013.00 TO NODE 21014.00 IS CODE = 54  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) >>>>>	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
ELEVATION DATA: UPSTREAM(FEET) = 1433.00 DOWNSTREAM(FEET) = 1380.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 1311.64 CHANNEL SLOPE = 0.0404 CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH(FEET) = 2.50	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.84
CHANNEL FLOW THRU SUBAREA(CFS) = 62.73  FLOW VELOCITY(FEET/SEC.) = 6.40 FLOW DEPTH(FEET) = 0.99  TRAVEL TIME(MIN.) = 3.42 Tc(MIN.) = 20.99  LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21014.00 = 4024.57 FEET.	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 90.21 ***STREET FLOWING FULL*** STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.66
** PEAK FLOW RATE TABLE **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 62.73 20.99 1.803 0.75 (0.45) 0.60 44.8 21010.00  2 62.61 21.30 1.787 0.75 (0.45) 0.60 45.3 21000.00	HALFSTREET FLOOD WIDTH(FEET) = 26.19  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.24  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.14  STREET FLOW TRAVEL TIME(MIN.) = 3.58 Tc(MIN.) = 24.57  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.640
NEW PEAK FLOW DATA ARE:  PEAK FLOW RATE (CFS) = 62.73 Tc (MIN.) = 20.99  AREA-AVERAGED Fm (INCH/HR) = 0.45 AREA-AVERAGED Fp (INCH/HR) = 0.75  AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA (ACRES) = 44.77	SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 4.31 0.75 0.600 56
**************************************	MOBILE HOME PARK B 9.23 0.75 0.250 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.361  SUBAREA AREA(ACRES) = 13.54  SUBAREA RUNOFF(CFS) = 16.69  EFFECTIVE AREA(ACRES) = 80.10  AREA-AVERAGED FM(INCH/HR) = 0.41
MAINLINE Tc(MIN.) = 20.99  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.803 SUBAREA LOSS RATE DATA(AMC II):	AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.55  TOTAL AREA (ACRES) = 80.6 PEAK FLOW RATE (CFS) = 88.83
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
"3-4 DWELLINGS/ACRE" B 19.47 0.75 0.600 56	END OF SUBAREA STREET FLOW HYDRAULICS:
Date: 04/21/2014 File name: LR0210ZZ.RES Page 7	Date: 04/21/2014 File name: LR0210ZZ.RES Page 8

```
DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.01
 FLOW VELOCITY (FEET/SEC.) = 6.23 DEPTH*VELOCITY (FT*FT/SEC.) = 4.11
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21015.00 = 5364.06 FEET.
*****************
 FLOW PROCESS FROM NODE 21015.00 TO NODE 21032.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1345.00 DOWNSTREAM ELEVATION(FEET) = 1332.00
 STREET LENGTH (FEET) = 945.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 30.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.70
 STREET FLOW TRAVEL TIME (MIN.) = 3.16 Tc (MIN.) = 27.73
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.525
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               Aр
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                              1.76
                                        0.75
                                                0.600 56
 SCHOOL
                        В
                               3.85
                                        0.75
                                                0.600 56
 MOBILE HOME PARK
                        В
                               2.60
                                        0.75
                                                0.250
 PUBLIC PARK
                               0.44
                                        0.75
                                                0.850 56
 COMMERCIAL
                        В
                               0.91
                                        0.75
                                                0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.469
 SUBAREA AREA (ACRES) = 9.56 SUBAREA RUNOFF (CFS) = 10.11
 EFFECTIVE AREA(ACRES) = 89.66 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 90.2 PEAK FLOW RATE (CFS) =
                                                         90.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73 HALFSTREET FLOOD WIDTH(FEET) = 29.67
 FLOW VELOCITY (FEET/SEC.) = 4.94 DEPTH*VELOCITY (FT*FT/SEC.) = 3.63
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
```

```
FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.73
 RAINFALL INTENSITY (INCH/HR) = 1.53
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.54
 EFFECTIVE STREAM AREA(ACRES) = 89.66
 TOTAL STREAM AREA(ACRES) = 90.17
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  90.65
******************
 FLOW PROCESS FROM NODE 21020.00 TO NODE 21021.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 732.03
 ELEVATION DATA: UPSTREAM(FEET) = 1442.00 DOWNSTREAM(FEET) = 1440.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.306
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.179
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Αp
                                                     SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                            1.89
                                    0.75 0.600 56 18.77
 MOBILE HOME PARK
                       B 4.31 0.75 0.250
                                                     56 15.31
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.357
 SUBAREA RUNOFF(CFS) = 10.67
 TOTAL AREA (ACRES) = 6.20 PEAK FLOW RATE (CFS) = 10.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21021.00 TO NODE 21022.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1440.00 DOWNSTREAM ELEVATION(FEET) = 1433.00
 STREET LENGTH (FEET) = 186.35 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
       Date: 04/21/2014
                     File name: LR0210ZZ.RES
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.91
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.19
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.61
 STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 16.05
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.118
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     B 4.18 0.75 0.250 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.81 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.307
 SUBAREA AREA(ACRES) = 4.99
                               SUBAREA RUNOFF(CFS) = 8.48
 EFFECTIVE AREA(ACRES) = 11.19 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 TOTAL AREA (ACRES) = 11.2 PEAK FLOW RATE (CFS) =
                                                          18.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.13
 FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 1.82
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21022.00 = 918.38 FEET.
*******************
 FLOW PROCESS FROM NODE 21022.00 TO NODE 21023.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1433.00 DOWNSTREAM ELEVATION(FEET) = 1416.00
 STREET LENGTH (FEET) = 274.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 14.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.38
```

```
STREET FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 16.84
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.057
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK B 6.51 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.37 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.311
 SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 12.94
 EFFECTIVE AREA(ACRES) = 19.07 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 19.1 PEAK FLOW RATE (CFS) =
                                                         31.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.70
 FLOW VELOCITY (FEET/SEC.) = 6.03 DEPTH*VELOCITY (FT*FT/SEC.) = 2.65
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21023.00 = 1192.68 FEET.
************************
 FLOW PROCESS FROM NODE 21023.00 TO NODE 21024.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1416.00 DOWNSTREAM ELEVATION(FEET) = 1402.00
 STREET LENGTH (FEET) = 250.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.82
 STREET FLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 17.54
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.008
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                      B 6.35 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.47 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

File name: LR0210ZZ.RES

Page 12

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.274
 SUBAREA AREA (ACRES) = 6.82 SUBAREA RUNOFF (CFS) = 11.07
 EFFECTIVE AREA(ACRES) = 25.89 AREA-AVERAGED Fm(INCH/HR) = 0.23
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.31
 TOTAL AREA (ACRES) = 25.9 PEAK FLOW RATE (CFS) = 41.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.88
 FLOW VELOCITY(FEET/SEC.) = 6.24 DEPTH*VELOCITY(FT*FT/SEC.) = 3.02
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21024.00 = 1443.07 FEET.
*******************
 FLOW PROCESS FROM NODE 21024.00 TO NODE 21025.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1402.00 DOWNSTREAM ELEVATION(FEET) = 1390.00
 STREET LENGTH (FEET) = 390.63 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 46.68
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.39
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.90
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 18.74
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.930
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Ар
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE"
                     В
                              4.17
                                        0.75 0.600 56
                                3.23
                                                0.250 56
 MOBILE HOME PARK
                      В
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.447
 SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 10.62
 EFFECTIVE AREA(ACRES) = 33.29 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) = 50.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
```

File name: LR0210ZZ.RES

Page 13

Date: 04/21/2014

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.39
 FLOW VELOCITY (FEET/SEC.) = 5.54 DEPTH*VELOCITY (FT*FT/SEC.) = 3.04
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21025.00 = 1833.70 FEET.
*******************
 FLOW PROCESS FROM NODE 21025.00 TO NODE 21026.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1385.00
 STREET LENGTH (FEET) = 357.04 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   52.55
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.66
 STREET FLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 20.13
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.849
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.32 0.75 0.600
                                                        56
 COMMERCIAL
                              1.20 0.75 0.100 56
                             0.81 0.75 0.250 56
 MOBILE HOME PARK
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.335
 SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) = 4.79
 EFFECTIVE AREA (ACRES) = 36.62 AREA-AVERAGED Fm (INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 52.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.99
 FLOW VELOCITY (FEET/SEC.) = 4.29 DEPTH*VELOCITY (FT*FT/SEC.) = 2.66
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21026.00 = 2190.74 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1385.00 DOWNSTREAM ELEVATION(FEET) = 1374.00
 STREET LENGTH (FEET) = 355.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.56
  HALFSTREET FLOOD WIDTH (FEET) = 21.25
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.80
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.28
 STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 21.15
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.795
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                               2.67
                                       0.75
                                             0.600 56
 COMMERCIAL
                      В
                              3.22 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.327
 SUBAREA AREA (ACRES) = 5.89 SUBAREA RUNOFF (CFS) = 8.22
 EFFECTIVE AREA(ACRES) = 42.51 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 42.5 PEAK FLOW RATE(CFS) =
                                                        58.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.61
 FLOW VELOCITY (FEET/SEC.) = 5.85 DEPTH*VELOCITY (FT*FT/SEC.) = 3.35
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21027.00 = 2546.13 FEET.
******************
 FLOW PROCESS FROM NODE 21027.00 TO NODE 21028.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1374.00 DOWNSTREAM ELEVATION(FEET) = 1368.00
 STREET LENGTH (FEET) = 309.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    62.40
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.15
 STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 22.17
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.745
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.72 0.75 0.600 56
 COMMERCIAL
                              2.05
                                      0.75 0.100 56
                       В
 MOBILE HOME PARK B 0.45 0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
 SUBAREA AREA(ACRES) = 5.22 SUBAREA RUNOFF(CFS) = 6.88
 EFFECTIVE AREA(ACRES) = 47.73 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 47.7 PEAK FLOW RATE (CFS) = 63.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.30
 FLOW VELOCITY (FEET/SEC.) = 5.10 DEPTH*VELOCITY (FT*FT/SEC.) = 3.19
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21028.00 = 2855.86 FEET.
*******************
 FLOW PROCESS FROM NODE 21028.00 TO NODE 21029.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1368.00 DOWNSTREAM ELEVATION (FEET) = 1363.00
 STREET LENGTH (FEET) = 301.04 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 16

Date: 04/21/2014 Page 15 File name: LR021077.RFS

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.52
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.18
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 23.19
  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.698
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.13
                                       0.75
                                               0.600 56
 COMMERCIAL
                      В
                              2.11
                                       0.75 0.100 56
 MOBILE HOME PARK
                      В
                                0.89
                                         0.75
                                                 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.334
 SUBAREA AREA(ACRES) = 5.13
                                SUBAREA RUNOFF(CFS) = 6.69
 EFFECTIVE AREA(ACRES) = 52.86 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) = 52.9 PEAK FLOW RATE(CFS) = 68.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.70
 FLOW VELOCITY (FEET/SEC.) = 4.92 DEPTH*VELOCITY (FT*FT/SEC.) = 3.22
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21029.00 = 3156.90 FEET.
FLOW PROCESS FROM NODE 21029.00 TO NODE 21030.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1363.00 DOWNSTREAM ELEVATION (FEET) = 1350.00
 STREET LENGTH (FEET) = 360.35 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH(FEET) = 0.64
  HALFSTREET FLOOD WIDTH (FEET) = 24.79
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.08
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.50
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 24.04
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.662
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                    В
                            9.68 0.75 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 27.42 0.75 0.600
                                                    56
 MOBILE HOME PARK
                   B 2.60 0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455
 SUBAREA AREA (ACRES) = 39.70 SUBAREA RUNOFF (CFS) = 47.21
 EFFECTIVE AREA(ACRES) = 92.56 AREA-AVERAGED Fm(INCH/HR) = 0.29
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 TOTAL AREA (ACRES) = 92.6 PEAK FLOW RATE (CFS) = 114.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.92
 FLOW VELOCITY (FEET/SEC.) = 7.49 DEPTH*VELOCITY (FT*FT/SEC.) = 5.08
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 360.4 FT WITH ELEVATION-DROP = 13.0 FT, IS 121.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21030.00
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21030.00 = 3517.25 FEET.
************************
 FLOW PROCESS FROM NODE 21030.00 TO NODE 21031.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1340.00
 FLOW LENGTH (FEET) = 474.31 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 2.50
 FLOWDEPTH IN BOX IS 1.31 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 14.52
 BOX-FLOW(CFS) = 114.10
 BOX-FLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 24.59
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21031.00 = 3991.56 FEET.
***********************
FLOW PROCESS FROM NODE 21031.00 TO NODE 21031.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 24.59
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.640
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           Ар
                                                    SCS
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 2.14
                                      0.75
                                             0.600
                                                    56
 COMMERCIAL
                      В
                              3.35
                                      0.75
                                             0.100
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 18

```
SCHOOL
                           0.63 0.75 0.600 56
                                                                         RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         CONFLUENCE FORMULA USED FOR 2 STREAMS.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
                            SUBAREA RUNOFF (CFS) = 7.69
 SUBAREA AREA(ACRES) = 6.12
                                                                         ** PEAK FLOW RATE TABLE **
 EFFECTIVE AREA(ACRES) = 98.68 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                         STREAM O
                                                                                       Tc Intensity Fp(Fm) Ap Ae HEADWATER
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
                                                                         NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                  (ACRES) NODE
 TOTAL AREA (ACRES) = 98.7 PEAK FLOW RATE (CFS) = 119.94
                                                                          1
                                                                                 210.51 24.59 1.640 0.75(0.34) 0.46 180.1 21020.00
                                                                           2.
                                                                                 202.28 27.73 1.525 0.75(0.34) 0.46
                                                                                                                    190.2 21010.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 201.04 28.04 1.515 0.75(0.34) 0.46 190.7 21000.00
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                         COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
*****************
                                                                         PEAK FLOW RATE (CFS) = 210.51 Tc (MIN.) = 24.59
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 81
                                                                         EFFECTIVE AREA(ACRES) = 180.06 AREA-AVERAGED Fm(INCH/HR) = 0.34
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         TOTAL AREA (ACRES) =
                                                                                          190.7
______
                                                                         LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
 MAINLINE Tc(MIN.) = 24.59
                                                                        * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.640
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 21032.00 TO NODE 21043.00 IS CODE = 48
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                 ďΨ
                                                                       _______
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 "3-4 DWELLINGS/ACRE" B 0.62
                                    0.75 0.600 56
                                                                       _____
 SCHOOL
                    В
                           1.27
                                  0.75
                                          0.600
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1327.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         FLOW LENGTH (FEET) = 353.61 MANNING'S N = 0.014
                                                                         GIVEN BOX BASEWIDTH (FEET) = 11.00 GIVEN BOX HEIGHT (FEET) = 2.50
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 1.89
                           SUBAREA RUNOFF (CFS) = 2.03
                                                                         FLOWDEPTH IN BOX IS 1.41 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 13.60
 EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                         BOX-FLOW(CFS) = 210.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 0.43 Tc (MIN.) = 25.02
                                                                         LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.
 TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) =
                                                                       ************************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                       ______
************************
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1
                                                                       _____
                                                                         MAINLINE Tc (MIN.) = 25.02
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                         * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.623
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
______
                                                                                                         Fρ
                                                                                                                  Дp
                                                                                                                          SCS
 TOTAL NUMBER OF STREAMS = 2
                                                                           LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                         RESIDENTIAL
                                                                         "3-4 DWELLINGS/ACRE" B 2.84 0.75
                                                                                                                  0.600
 TIME OF CONCENTRATION (MIN.) = 24.59
                                                                                                                          56
 RAINFALL INTENSITY (INCH/HR) = 1.64
                                                                                                   2.77
                                                                                                         0.75
                                                                                                                   0.600
                                                                                                    2.00
                                                                                                                          56
 AREA-AVERAGED Fm(INCH/HR) = 0.29
                                                                         COMMERCIAL
                                                                                            В
                                                                                                            0.75
                                                                                                                   0.100
                                                                                            в 6.89
                                                                                                            0.75
                                                                                                                   0.250
                                                                                                                          56
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                         MOBILE HOME PARK
 AREA-AVERAGED Ap = 0.39
                                                                         PUBLIC PARK
                                                                                            B
                                                                                                    1.56
                                                                                                            0.75
 EFFECTIVE STREAM AREA(ACRES) = 100.57
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL STREAM AREA(ACRES) = 100.57
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 121.97
                                                                         SUBAREA AREA(ACRES) = 16.06 SUBAREA RUNOFF(CFS) = 19.00
                                                                         EFFECTIVE AREA(ACRES) = 196.12 AREA-AVERAGED Fm(INCH/HR) = 0.34
 ** CONFLUENCE DATA **
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
  STREAM
        Q Tc Intensity Fp(Fm) Ap Ae
                                                  HEADWATER
                                                                         TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 226.74
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                           89.7 21010.00
    1
          90.65 27.73 1.525 0.75(0.40) 0.54
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
    1
         90.33 28.04 1.515 0.75(0.40) 0.54
                                           90.2 21000.00
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.39; 6HR = 2.19; 24HR = 4.26
         121.97 24.59 1.640 0.75(0.29) 0.39
                                           100.6 21020.00
                                                                         ** PEAK FLOW RATE TABLE **
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 19

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 20

```
Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                UPSTREAM ELEVATION(FEET) = 1350.00 DOWNSTREAM ELEVATION(FEET) = 1341.00
  STREAM
            0
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
                                                                                STREET LENGTH (FEET) = 642.50 CURB HEIGHT (INCHES) = 6.0
    1
          226.90 25.00 1.623 0.75(0.34) 0.45
                                               196.1 21020.00
                                                                                STREET HALFWIDTH (FEET) = 18.00
    2
          217.48 28.13 1.512 0.75(0.34) 0.46
                                               206.3 21010.00
          216.25 28.42 1.503 0.75(0.34) 0.46
                                               206.8 21000.00
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 NEW PEAK FLOW DATA ARE:
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 PEAK FLOW RATE (CFS) = 226.90 Tc (MIN.) = 25.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 AREA-AVERAGED Ap = 0.45 EFFECTIVE AREA(ACRES) =
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
******************
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 ***STREET FLOWING FULL***
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TIME OF CONCENTRATION (MIN.) = 25.00
                                                                                 STREET FLOW DEPTH (FEET) = 0.54
 RAINFALL INTENSITY (INCH/HR) = 1.62
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 20.21
 AREA-AVERAGED Fm(INCH/HR) = 0.34
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.71
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.02
 AREA-AVERAGED Ap = 0.45
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 14.81
 EFFECTIVE STREAM AREA(ACRES) = 196.12
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.222
 TOTAL STREAM AREA(ACRES) = 206.80
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 226.90
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    LAND USE
*****
                                                                                RESIDENTIAL
 FLOW PROCESS FROM NODE 21040.00 TO NODE 21041.00 IS CODE = 21
                                                                                "3-4 DWELLINGS/ACRE"
                                                                                                   B 4.00 0.75
                                                                                                                              0.600
                                                                                                           5.39
                                                                                                                      0.75
                                                                                                                              0.100
                                                                                COMMERCIAL
                                                                                                    В
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                SCHOOL
                                                                                                      B
                                                                                                              1.37
                                                                                                                      0.75 0.600
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 905.71
                                                                                SUBAREA AREA (ACRES) = 10.76 SUBAREA RUNOFF (CFS) = 18.99
 ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1350.00
                                                                                EFFECTIVE AREA (ACRES) = 22.04 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                                TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.925
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.531
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                              Ap SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
                               7.08
                                              0.100
 COMMERCIAL
                                       0.75
                                                      56 11.92
                                                                                DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.55
 RESIDENTIAL
                                                                                FLOW VELOCITY (FEET/SEC.) = 3.93 DEPTH*VELOCITY (FT*FT/SEC.) = 2.24
 "3-4 DWELLINGS/ACRE" B 4.20
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                     AND L = 642.5 FT WITH ELEVATION-DROP = 9.0 FT, IS 25.6 CFS,
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
                                                                                     WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21042.00
 SUBAREA RUNOFF (CFS) = 23.52
                                                                                LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21042.00 = 1548.21 FEET.
 TOTAL AREA (ACRES) = 11.28 PEAK FLOW RATE (CFS) = 23.52
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 21042.00 TO NODE 21043.00 IS CODE = 48
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                                >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                               >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                              ______
 FLOW PROCESS FROM NODE 21041.00 TO NODE 21042.00 IS CODE = 63
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1341.00 DOWNSTREAM(FEET) = 1327.00
                                                                                FLOW LENGTH (FEET) = 896.68 MANNING'S N = 0.014
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               GIVEN BOX BASEWIDTH (FEET) = 5.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                               FLOWDEPTH IN BOX IS 0.82 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 9.61
```

Date: 04/21/2014

File name: LR0210ZZ.RES

Date: 04/21/2014 File name: LR0210ZZ.RES Page 22

33.04

56

56

39.38

```
NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES)
 BOX-FLOW(CFS) =
                 39.38
                                                                                                                             NODE
 BOX-FLOW TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 16.36
                                                                                  247.91 16.36 2.093 0.75(0.33) 0.44
                                                                                                                      156.0 21040.00
 LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21043.00 = 2444.89 FEET.
                                                                                  260.31 25.00
                                                                                               1.623 0.75(0.33) 0.44
                                                                                                                      223.7 21020.00
                                                                                  248.13 28.13
                                                                                               1.512 0.75(0.33) 0.45
                                                                                                                      233.9 21010.00
************************
                                                                                  246.67 28.42
                                                                                               1.503 0.75(0.33) 0.45
                                                                                                                      234.4 21000.00
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          PEAK FLOW RATE (CFS) = 260.31 Tc (MIN.) = 25.00
_____
                                                                          EFFECTIVE AREA(ACRES) = 223.72 AREA-AVERAGED Fm(INCH/HR) = 0.33
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44
 MAINLINE Tc(MIN.) = 16.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.093
                                                                          TOTAL AREA (ACRES) = 234.4
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                                        ******************
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    В
                            0.11 0.75
                                            0.100
                                                                          FLOW PROCESS FROM NODE 21043.00 TO NODE 21044.00 IS CODE = 48
                                                                        ______
 RESIDENTIAL
                                                 56
 "3-4 DWELLINGS/ACRE" B
                             2.51
                                     0.75
                                            0.600
                                                                          >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                    В
                             2.94
                                     0.75 0.600 56
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1318.00
 SUBAREA AREA(ACRES) = 5.56
                            SUBAREA RUNOFF (CFS) = 8.27
                                                                          FLOW LENGTH (FEET) = 665.51 MANNING'S N = 0.014
 EFFECTIVE AREA(ACRES) = 27.60 AREA-AVERAGED Fm(INCH/HR) = 0.28
                                                                          GIVEN BOX BASEWIDTH(FEET) = 12.00 GIVEN BOX HEIGHT(FEET) = 2.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37
                                                                          FLOWDEPTH IN BOX IS 1.54 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 14.12
 TOTAL AREA (ACRES) = 27.6 PEAK FLOW RATE (CFS) = 45.08
                                                                          BOX-FLOW(CFS) = 260.31
                                                                          BOX-FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 25.78
                                                                          LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                        *******************
*****************
                                                                          FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 81
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1
______
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                        ______
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                          MAINLINE Tc(MIN.) = 25.78
______
                                                                          * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.594
 TOTAL NUMBER OF STREAMS = 2
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                     αA
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TIME OF CONCENTRATION (MIN.) = 16.36
 RAINFALL INTENSITY (INCH/HR) = 2.09
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE" B
 AREA-AVERAGED Fm(INCH/HR) = 0.28
                                                                                                    4.70
                                                                                                              0.75
                                                                                                                     0.600
                                                                                   В 13.39
                                                                                                              0.75 0.100 56
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                          COMMERCIAL
 AREA-AVERAGED Ap = 0.37
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 27.60
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.230
 TOTAL STREAM AREA(ACRES) = 27.60
                                                                          SUBAREA AREA(ACRES) = 18.09 SUBAREA RUNOFF(CFS) = 23.14
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 45.08
                                                                          EFFECTIVE AREA(ACRES) = 241.81 AREA-AVERAGED Fm(INCH/HR) = 0.32
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
                                                                          TOTAL AREA (ACRES) = 252.5 PEAK FLOW RATE (CFS) =
 ** CONFLUENCE DATA **
                                                                                                                           277.44
  STREAM
        Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
    1
         226.90 25.00 1.623 0.75(0.34) 0.45
                                           196.1 21020.00
                                                                          5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
    1
         217.48 28.13 1.512 0.75(0.34) 0.46
                                            206.3 21010.00
          216.25 28.42
                      1.503 0.75(0.34) 0.46
                                            206.8 21000.00
                                                                          ** PEAK FLOW RATE TABLE **
          45.08 16.36 2.093 0.75(0.28) 0.37
                                            27.6 21040.00
                                                                           STREAM
                                                                                  0
                                                                                        Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES) NODE
                                                                                  270.39 17.12 2.037 0.75(0.31) 0.42 174.1 21040.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                            1
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                  278.07 25.71
                                                                                              1.596 0.75(0.32)0.43
                                                                                                                      241.8 21020.00
                                                                                  265.06 28.81 1.491 0.75(0.32) 0.43
                                                                                                                      252.0 21010.00
 ** PEAK FLOW RATE TABLE **
                                                                                  263.75 29.06 1.483 0.75(0.32) 0.43
                                                                                                                      252.5 21000.00
  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                  HEADWATER
                                                                          NEW PEAK FLOW DATA ARE:
      Date: 04/21/2014
                                                 Page 23
                                                                               Date: 04/21/2014 File name: LR0210ZZ.RES
```

File name: LR021077.RFS

```
PEAK FLOW RATE (CFS) = 278.07 Tc (MIN.) = 25.71
 AREA-AVERAGED Fm(INCH/HR) = 0.32 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.43 EFFECTIVE AREA(ACRES) = 241.81
**********************
 FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20968.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4775.17 Tc (MIN.) = 51.30
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.55
 TOTAL AREA (ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
*******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 4775.17 Tc (MIN.) = 51.30
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.55
 TOTAL AREA (ACRES) = 10106.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
******************
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
FLOW PROCESS FROM NODE 20968.00 TO NODE 21044.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1335.00 DOWNSTREAM(FEET) = 1318.00
 FLOW LENGTH (FEET) = 1136.29 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 23.00 GIVEN BOX HEIGHT(FEET) = 10.00
 FLOWDEPTH IN BOX IS 6.28 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 33.05
 BOX-FLOW(CFS) = 4775.17
 BOX-FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 51.88
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
```

File name: LR021077.RFS

Page 25

Date: 04/21/2014

\*\* MAIN STREAM CONFLUENCE DATA \*\* PEAK FLOW RATE (CFS) = 4775.17 Tc (MIN.) = 51.88AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.55TOTAL AREA(ACRES) = 10106.9 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET. \*\* MEMORY BANK # 1 CONFLUENCE DATA \*\* Tc Intensity Fp(Fm) STREAM Q Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 270.39 17.12 2.037 0.75 (0.31) 0.42 174.1 21040.00 278.07 25.71 1.596 0.75(0.32) 0.43 241.8 21020.00 265.06 28.81 1.491 0.75(0.32) 0.43 252.0 21010.00 263.75 29.06 1.483 0.75 (0.32) 0.43 252.5 21000.00 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.46;24H= 5.36 S-GRAPH: VALLEY(DEV.) = 69.9%; VALLEY(UNDEV.) / DESERT= 30.1% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.51; Ybar = 0.55 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.67; 3HR = 0.94; 6HR = 0.97; 24HR = 0.98UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10359.4 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0289; Lca/L=0.4,n=.0259; Lca/L=0.5,n=.0238; Lca/L=0.6,n=.0222 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2141.02 PEAK FLOW RATE (CFS) = 4876.02\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<<< \_\_\_\_\_ \* FLOW PROCESS FROM NODE 21044.00 TO NODE 21045.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1318.00 DOWNSTREAM(FEET) = 1295.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 1385.05 CHANNEL SLOPE = 0.0166 CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50 CHANNEL FLOW THRU SUBAREA(CFS) = 4876.02 FLOW VELOCITY (FEET/SEC.) = 31.11 FLOW DEPTH (FEET) = 5.86 TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 52.62LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET. FLOW PROCESS FROM NODE 21045.00 TO NODE 21045.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

\_\_\_\_\_\_

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.022
MAINLINE Tc (MIN.) = 52.62
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.039
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fρ
                                                                                                                                 SCS
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          22.52
                                                                                                                   0.98
                                                                                                                          0.100
                                                                                                                                  32
                                      Fρ
                                               Αp
                                                                             COMMERCIAL
                                                                                                  A
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             RESIDENTIAL
                                                                                                         7.83
                                                                                                                   0.98
                                                                                                                          0.600
 RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                 Α
                              25.15
                                              0.500
                                                                                                                                  56
 "5-7 DWELLINGS/ACRE"
                     A
                                       0.98
                                                                             COMMERCIAL
                                                                                                   В
                                                                                                          38.49
                                                                                                                   0.75
                                                                                                                           0.100
                                              0.100
                                                    32
 COMMERCIAL
                       Α
                              34.08
                                       0.98
                                                                             PUBLIC PARK
                                                                                                  A
                                                                                                         8.61
                                                                                                                   0.98
                                                                                                                           0.850
                                                                                                                                  32
                                              0.600
                                                    32
 SCHOOL
                       Α
                              9.02
                                       0.98
                                                                             RESIDENTIAL
                                                                                                 B 4.45
 RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE"
                                                                                                                   0.75
                                                                                                                          0.600
                                                                                                                                  56
 "3-4 DWELLINGS/ACRE"
                                                                                                          0.52
                                                                                                                          0.250
                             6.36
                                       0.98
                                              0.600
                                                    32
                                                                             MOBILE HOME PARK
                                                                                                    B
                                                                                                                   0.75
                                                                                                                                  56
                       A
 COMMERCIAL
                       В
                              60.62
                                       0.75
                                              0.100
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
 RESIDENTIAL
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.254
 "3-4 DWELLINGS/ACRE"
                       В
                              23.64
                                       0.75
                                              0.600
                                                                             SUBAREA AREA (ACRES) = 82.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
                                                                             UNIT-HYDROGRAPH DATA:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
                                                                             RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.74;6H= 2.46;24H= 5.33
 SUBAREA AREA(ACRES) = 158.87
                                                                             S-GRAPH: VALLEY (DEV.) = 70.6%; VALLEY (UNDEV.) / DESERT= 29.4%
 UNIT-HYDROGRAPH DATA:
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.46;24H= 5.34
                                                                             Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.51; Ybar = 0.54
 S-GRAPH: VALLEY (DEV.) = 70.3%; VALLEY (UNDEV.) / DESERT= 29.7%
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
 Tc(HR) = 0.88; LAG(HR) = 0.70; Fm(INCH/HR) = 0.51; Ybar = 0.54
                                                                             3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10600.7
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10518.3
                                                                              Lca/L=0.3,n=.0276; Lca/L=0.4,n=.0247; Lca/L=0.5,n=.0227; Lca/L=0.6,n=.0212
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET.
                                                                             TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2201.61
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4885.78
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234; Lca/L=0.6,n=.0219
                                                                              TOTAL AREA (ACRES) = 10600.7 PEAK FLOW RATE (CFS) = 4925.52
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2180.46
                                                                             NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4925.52
 TOTAL AREA (ACRES) = 10518.3
                            PEAK FLOW RATE (CFS) = 4925.52
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            *******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                              FLOW PROCESS FROM NODE 21046.00 TO NODE 21069.00 IS CODE = 54
FLOW PROCESS FROM NODE 21045.00 TO NODE 21046.00 IS CODE = 54
                                                                              >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
______
                                                                             >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            _____
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1250.00 DOWNSTREAM(FEET) = 1215.00
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
                                                                             CHANNEL LENGTH THRU SUBAREA (FEET) = 2718.03 CHANNEL SLOPE = 0.0129
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1250.00
                                                                             CHANNEL BASE (FEET) = 18.00 "Z" FACTOR = 2.000
                                                                             MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2744.77 CHANNEL SLOPE = 0.0164
 CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000
                                                                             CHANNEL FLOW THRU SUBAREA(CFS) = 4925.52
                                                                             FLOW VELOCITY (FEET/SEC.) = 28.11 FLOW DEPTH (FEET) = 5.89
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50
                                                                             TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 55.70
 CHANNEL FLOW THRU SUBAREA(CFS) = 4925.52
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 FLOW VELOCITY (FEET/SEC.) = 31.03 FLOW DEPTH (FEET) = 5.92
 TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 54.09
                                                                            ******************
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
                                                                              FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 81
******************
                                                                            ______
 FLOW PROCESS FROM NODE 21046.00 TO NODE 21046.00 IS CODE = 81
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                            ______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             MAINLINE Tc (MIN.) = 55.70
_____
                                                                              * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.004
 MAINLINE Tc(MIN.) = 54.09
                                                                             SUBAREA LOSS RATE DATA (AMC II):
```

Date: 04/21/2014

File name: LR021077.RFS

Page 28

LAND USE RESIDENTIAL				Ap		
	GKOUP	(ACKES)	(INCH/HR)	(DECIMAL)	CN	
		F 00	0.75	0.000	F.C	
"3-4 DWELLINGS/ACRE"	В	5.29	0.75	0.600	56	
COMMERCIAL						
COMMERCIAL	A	9.45	0.98	0.100	32	
RESIDENTIAL	_					
"3-4 DWELLINGS/ACRE"					32	
PUBLIC PARK	A	5.30			32	
PUBLIC PARK			0.75		56	
SUBAREA AVERAGE PERVIO		, .		.86		
SUBAREA AVERAGE PERVIO		ACTION, A	p = 0.268			
SUBAREA AREA(ACRES) =	46.47					
UNIT-HYDROGRAPH DATA:						
RAINFALL(INCH): 5M= 0.3					24H=	5.33
S-GRAPH: VALLEY(DEV.)=						
MOUNTAIN= 0.0	0%;FOOTHIL	L= 0.0%;	DESERT (UNDE	V.)= 0.0%		
Tc(HR) = 0.93; LAG(HR)	= 0.74; Fr	n(INCH/HR	) = 0.51; Y	bar = 0.54		
USED SIERRA MADRE DEPT	H-AREA CUR	VES WITH .	AMC II CON	DITION.		
DEPTH-AREA FACTORS: 5M	= 0.66; 30	OM = 0.67	; 1HR = 0.6	7;		
3HR = 0.94; 6HR = 0.97	; 24HR= 0.9	98				
UNIT-INTERVAL(MIN) = !	5.00 TOTA	AL AREA(A	CRES) =	10647.2		
LONGEST FLOWPATH FROM I	NODE 2012	0.00 TO N	ODE 21069.	00 = 450	66.88	FEET.
EQUIVALENT BASIN FACTO	OR APPROXI	MATIONS:				
Lca/L=0.3, n=.0269; Lca	a/L=0.4, n=	.0241; Lc	a/L=0.5, n=.	0221;Lca/L	=0.6,	n = .020
TIME OF PEAK FLOW(HR) :	= 16.75 RI	JNOFF VOL	UME(AF) =	2213.48		
UNIT-HYDROGRAPH PEAK F						
TOTAL AREA (ACRES) =				CFS) =	4925.	52
NOTE: PEAK FLOW RATE DI				,		
FLOW PROCESS FROM NODE	21069.00	TO NODE	21069.00 I	S CODE =	10	
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON	TO NODE	21069.00 I  Y BANK # 1	S CODE = 	10	
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON	TO NODE	21069.00 I  Y BANK # 1	S CODE = 	10	
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON	TO NODE	21069.00 I Y BANK # 1	S CODE = 	10 	
FLOW PROCESS FROM NODE	21069.00 Y COPIED OI	TO NODE  NTO MEMOR  ********	21069.00 I Y BANK # 1	S CODE =	10  ==== ****	
FLOW PROCESS FROM NODE	21069.00 Y COPIED OD ***********************************	TO NODE  NTO MEMOR  ********  TO NODE	21069.00 I 	S CODE =	10  ==== ****	
FLOW PROCESS FROM NODE  >>>>MAIN-STREAM MEMOR:  ***********************************	21069.00 Y COPIED OD ***********************************	TO NODE  NTO MEMOR  ********  TO NODE	21069.00 I Y BANK # 1 ***********************************	S CODE =	10  ==== ****	
FLOW PROCESS FROM NODE  >>>>MAIN-STREAM MEMOR:  ******************** FLOW PROCESS FROM NODE  >>>>>RATIONAL METHOD II	21069.00 Y COPIED OD *********** 21050.00	TO NODE  NTO MEMOR  ********  TO NODE  AREA ANAL	21069.00 I Y BANK # 1 	S CODE =	10  ==== ****	
FLOW PROCESS FROM NODE  >>>>>MAIN-STREAM MEMOR  ***************  FLOW PROCESS FROM NODE  >>>>>RATIONAL METHOD II  >>USE TIME-OF-CONCENTRI	21069.00 Y COPIED OD ********** 21050.00 NITIAL SUBA	TO NODE  NTO MEMOR  *******  TO NODE  AREA ANAL  GRAPH FOR	21069.00 I Y BANK # 1 ********* 21050.50 I YSIS INITIAL SU	S CODE =	10  ==== ****	
FLOW PROCESS FROM NODE  >>>> MAIN-STREAM MEMOR  ****************  FLOW PROCESS FROM NODE	21069.00 Y COPIED OI ******** 21050.00 NITIAL SUBA ATION NOMOO	TO NODE	21069.00 I Y BANK # 1 ******** 21050.50 I YSIS<<<< INITIAL SU56	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE  >>>> MAIN-STREAM MEMOR  ****************  FLOW PROCESS FROM NODE	21069.00 Y COPIED OI ******** 21050.00 NITIAL SUBA ATION NOMOO	TO NODE	21069.00 I Y BANK # 1 ******** 21050.50 I YSIS<<<< INITIAL SU56	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE  >>>>MAIN-STREAM MEMOR  ****************  FLOW PROCESS FROM NODE	21069.00 Y COPIED OI ******** 21050.00 NITIAL SUBA ATION NOMOO ENGTH (FEET) AM (FEET) =	TO NODE	21069.00 I Y BANK # 1  ******** 21050.50 I  YSIS<<<< INITIAL SU  .56 0 DOWNSTRE	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE  >>>>MAIN-STREAM MEMOR  ****************  FLOW PROCESS FROM NODE	21069.00 Y COPIED OD ********* 21050.00 NITIAL SUBA ATION NOMOO ENGTH (FEET, AM (FEET) =	TO NODE  NTO MEMOR  ********  TO NODE  GRAPH FOR  1255.0  CON CHANGE	21069.00 I Y BANK # 1 *********** 21050.50 I YSIS<<<<<  INITIAL SU56 0 DOWNSTRE	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE	21069.00 Y COPIED OD ********* 21050.00	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<<  INITIAL SU  56 0 DOWNSTRE  0) ]**0.20 9.396	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE	21069.00  Y COPIED OF  *********  21050.00  NITIAL SUBA ATION NOMOO  ENGTH (FEET)  AM (FEET) =  ) / (ELEVATIO  MINIMUM TC  TENSITY (INC	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<<  INITIAL SU  56 0 DOWNSTRE  0) ]**0.20 9.396	S CODE =	10  ***** 21 	****
FLOW PROCESS FROM NODE  >>>>>MAIN-STREAM MEMOR:  ***************  FLOW PROCESS FROM NODE  >>>>>RATIONAL METHOD II  >>USE TIME-OF-CONCENTRE  INITIAL SUBAREA FLOW-LI  ELEVATION DATA: UPSTREE  TC = K*[(LENGTH** 3.00)  SUBAREA ANALYSIS USED II  * 25 YEAR RAINFALL IN'  SUBAREA TC AND LOSS RAY	Y COPIED ON  ********  21050.00  NITIAL SUBA ATION NOMOO  ENGTH (FEET)  AM (FEET) =  ) / (ELEVATIO MINIMUM TC TENSITY (IN) TE DATA (AMO	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<     INITIAL SU 56 0 DOWNSTRE 0)]**0.20 9.396 2.920	S CODE =	10  ***** 21  =====	******
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON ******** 21050.00 NITIAL SUBATION NOMOO ENGTH (FEET) AM (FEET) = ) / (ELEVATION MINIMUM TC TENSITY (INITE DATA (AMITE SOLUTION) SCS SOIL	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10  ***** 21  12 SCS	******** 50.00
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON ******** 21050.00 NITIAL SUBATION NOMOO ENGTH (FEET) AM (FEET) = ) / (ELEVATION MINIMUM TC TENSITY (INITE DATA (AMITE SOLUTION) SCS SOIL	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<     INITIAL SU 56 0 DOWNSTRE 0)]**0.20 9.396 2.920	S CODE =	10  ***** 21  12 SCS	******** 50.00
FLOW PROCESS FROM NODE  >>>>>MAIN-STREAM MEMOR:  ***************  FLOW PROCESS FROM NODE  >>>>>RATIONAL METHOD II  >>USE TIME-OF-CONCENTRE  INITIAL SUBAREA FLOW-LI  ELEVATION DATA: UPSTREE  TC = K*[(LENGTH** 3.00)  SUBAREA ANALYSIS USED II  * 25 YEAR RAINFALL IN'  SUBAREA TC AND LOSS RAY  DEVELOPMENT TYPE/  LAND USE	21069.00 Y COPIED ON ******** 21050.00 NITIAL SUBATION NOMOO ENGTH (FEET) AM (FEET) = ) / (ELEVATION MINIMUM TC TENSITY (INITE DATA (AMITE SOLUTION) SCS SOIL	TO NODE	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10  ***** 21  12 SCS	******** 50.00
FLOW PROCESS FROM NODE	21069.00  Y COPIED ON  ********  21050.00  NITIAL SUBA ATION NOMOO  ENGTH (FEET)  AM (FEET) =  ) / (ELEVATIO  MINIMUM TC  TENSITY (IN  TE DATA (AM  SCS SOIL  GROUP	TO NODE  NTO MEMOR  ********  TO NODE  AREA ANAL  GRAPH FOR  1255.0  DN CHANGE  (MIN.) =  CH/HR) =  C II):  AREA  (ACRES)	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10	****** 50.00  Tc (MIN.)
>>>>MAIN-STREAM MEMOR:  **************** FLOW PROCESS FROM NODE	21069.00  Y COPIED ON  ********  21050.00  NITIAL SUBA ATION NOMOO  ENGTH (FEET)  AM (FEET) =  ) / (ELEVATIO  MINIMUM TC  TENSITY (IN  TE DATA (AM  SCS SOIL  GROUP	TO NODE  NTO MEMOR  ********  TO NODE  AREA ANAL  GRAPH FOR  1255.0  DN CHANGE  (MIN.) =  CH/HR) =  C II):  AREA  (ACRES)	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10	****** 50.00  Tc (MIN.)
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON ******** 21050.00 NITIAL SUBATION NOMOC ===================================	TO NODE  NTO MEMOR  ********  TO NODE  AREA ANAL  GRAPH FOR  1255.0  DN CHANGE  (MIN.) =  CH/HR) =  C II):  AREA  (ACRES)	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10	****** 50.00  Tc (MIN.)
FLOW PROCESS FROM NODE	21069.00 Y COPIED ON ******** 21050.00 NITIAL SUBATION NOMOC ===================================	TO NODE  NTO MEMOR  ********  TO NODE  AREA ANAL  GRAPH FOR  1255.0  DN CHANGE  (MIN.) =  CH/HR) =  C II):  AREA  (ACRES)	21069.00 I Y BANK # 1  ********* 21050.50 I  YSIS<<<<	S CODE =	10	****** 50.00  Tc (MIN.)

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA RUNOFF(CFS) = 22.26
 TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21050.50 TO NODE 21051.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1250.00 DOWNSTREAM ELEVATION(FEET) = 1246.00
 STREET LENGTH (FEET) = 343.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     32.28
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.92
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 11.04
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.650
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                         SCS
                                                 αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 2.98 0.98 0.500 32 COMMERCIAL A 5.50 0.98 0.100 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.85
                                          0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA AREA (ACRES) = 9.33 SUBAREA RUNOFF (CFS) = 20.02
 EFFECTIVE AREA(ACRES) = 18.65 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 18.6
                                  PEAK FLOW RATE (CFS) = 40.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.41
```

Date: 04/21/2014 File name: LR0210ZZ.RES

0.85 0.98 0.600 32 12.73

Page 30

"3-4 DWELLINGS/ACRE" A

```
FLOW VELOCITY (FEET/SEC.) = 3.71 DEPTH*VELOCITY (FT*FT/SEC.) = 2.18
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21052.00
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                  LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21052.00 = 1620.30 FEET.
       AND L = 343.1 FT WITH ELEVATION-DROP = 4.0 FT, IS 25.5 CFS,
                                                                                WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21051.00
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21051.00 = 863.66 FEET.
                                                                                  FLOW PROCESS FROM NODE 21052.00 TO NODE 21067.00 IS CODE = 63
********************
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 21051.00 TO NODE 21052.00 IS CODE = 63
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                _____
                                                                                  UPSTREAM ELEVATION(FEET) = 1236.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 1432.84 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 1246.00 DOWNSTREAM ELEVATION(FEET) = 1236.00
 STREET LENGTH (FEET) = 756.64 CURB HEIGHT (INCHES) = 6.0
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   ***STREET FLOWING FULL***
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   STREET FLOW DEPTH (FEET) = 0.80
   ***STREET FLOWING FULL***
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 33.03
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.76
   STREET FLOW DEPTH(FEET) = 0.65
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.81
   HALFSTREET FLOOD WIDTH (FEET) = 25.52
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 5.02 Tc (MIN.) = 18.95
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.36
                                                                                  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.917
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.83
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 13.94
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
                                                                                                                                         SCS
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.305
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                       A 17.32
                                                                                                                          0.98
                                                                                                                                  0.500
                                                                                                                                         32
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  RESIDENTIAL
 RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                         В 1.30
                                                                                                                          0.75
                                                                                                                                  0.600
                                                                                                                                          56
 "5-7 DWELLINGS/ACRE"
                     A 1.87
                                        0.98
                                                 0.500 32
                                                                                  RESIDENTIAL
 COMMERCIAL
                      A 17.40
                                      0.98
                                                 0.100 32
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                         B 5.92
                                                                                                                          0.75
                                                                                                                                  0.500
                                                                                                                                          56
                                                                                                                6.47
                                                                                                                          0.75
                                                                                                                                  0.100
                                                                                                                                          56
 RESIDENTIAL
                                                                                  COMMERCIAL
                                                                                                         В
                     A 1.43 0.98
                                               0.600 32
                                                                                                               13.55
                                                                                                                          0.98
                                                                                                                                0.100
                                                                                                                                         32
 "3-4 DWELLINGS/ACRE"
                                                                                  COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" A 1.00 0.98 0.600
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.171
 SUBAREA AREA(ACRES) = 20.70
                             SUBAREA RUNOFF (CFS) = 39.84
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.91
 EFFECTIVE AREA(ACRES) = 39.35 AREA-AVERAGED Fm(INCH/HR) = 0.21
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.329
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.22
                                                                                  SUBAREA AREA (ACRES) = 45.56 SUBAREA RUNOFF (CFS) = 66.32
 TOTAL AREA (ACRES) = 39.3 PEAK FLOW RATE (CFS) =
                                                                                  EFFECTIVE AREA(ACRES) = 84.91 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.28
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  TOTAL AREA (ACRES) = 84.9 PEAK FLOW RATE (CFS) = 126.63
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.66
 FLOW VELOCITY (FEET/SEC.) = 4.62 DEPTH*VELOCITY (FT*FT/SEC.) = 3.20
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                  DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 35.28
       AND L = 756.6 FT WITH ELEVATION-DROP = 10.0 FT, IS 48.6 CFS,
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.94 DEPTH*VELOCITY (FT*FT/SEC.) = 4.18
```

Date: 04/21/2014

File name: LR0210ZZ.RES

Page 31

```
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1432.8 FT WITH ELEVATION-DROP = 16.0 FT, IS 83.3 CFS,
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21067.00
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21067.00 = 3053.14 FEET.
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
______
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                         21.76
 TIME OF CONCENTRATION (MIN.) = 18.95
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 RAINFALL INTENSITY (INCH/HR) = 1.92
                                                                              STREET FLOW DEPTH (FEET) = 0.66
 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 24.92
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.70
 AREA-AVERAGED Fp (INCH/HR) = 0.93
 AREA-AVERAGED Ap = 0.28
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.12
 EFFECTIVE STREAM AREA(ACRES) = 84.91
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 3.64 Tc (MIN.) = 22.82
 TOTAL STREAM AREA(ACRES) = 84.91
                                                                             * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.715
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 126.63
                                                                             SUBAREA LOSS RATE DATA (AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                                SCS
*******************
                                                                                LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21060.00 TO NODE 21061.00 IS CODE = 21
                                                                            RESIDENTIAL
                                                                            "5-7 DWELLINGS/ACRE" A 1.79 0.98 0.500
                                                                                                                                 32
                                                                             COMMERCIAL A 7.48 0.98 0.100
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                                                                32
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" A 1.27 0.98 0.600
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1000.00
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 ELEVATION DATA: UPSTREAM(FEET) = 1268.00 DOWNSTREAM(FEET) = 1267.00
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.228
                                                                             SUBAREA AREA(ACRES) = 10.54 SUBAREA RUNOFF(CFS) = 14.16
                                                                             EFFECTIVE AREA(ACRES) = 20.22 AREA-AVERAGED Fm(INCH/HR) = 0.22
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 19.181
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.23
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.903
                                                                             TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) = 27.19
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap SCS Tc
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
                                                                             5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.55
                                    0.98 0.500 32 24.54
                                                                             END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                                                                             DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.52
 "3-4 DWELLINGS/ACRE" A 1.16
                                    0.98 0.600 32 26.00
                                                                            FLOW VELOCITY (FEET/SEC.) = 1.82 DEPTH*VELOCITY (FT*FT/SEC.) = 1.27
                     A
                            6.97
                                      0.98
                                              0.100 32 19.18
                                                                             *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                  AND L = 371.0 FT WITH ELEVATION-DROP = 1.0 FT, IS 23.7 CFS,
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.224
                                                                                  WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21062.00
 SUBAREA RUNOFF (CFS) = 14.68
                                                                             LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21062.00 = 1371.00 FEET.
 TOTAL AREA (ACRES) = 9.68 PEAK FLOW RATE (CFS) = 14.68
                                                                           *******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             FLOW PROCESS FROM NODE 21062.00 TO NODE 21063.00 IS CODE = 63
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                            ._____
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                            >>>> (STREET TABLE SECTION # 18 USED) <<<<
 FLOW PROCESS FROM NODE 21061.00 TO NODE 21062.00 IS CODE = 63
                                                                           ______
._____
                                                                             UPSTREAM ELEVATION(FEET) = 1266.00 DOWNSTREAM ELEVATION(FEET) = 1265.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             STREET LENGTH (FEET) = 228.50 CURB HEIGHT (INCHES) = 8.0
                                                                             STREET HALFWIDTH (FEET) = 26.00
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1267.00 DOWNSTREAM ELEVATION(FEET) = 1266.00
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET LENGTH (FEET) = 371.00 CURB HEIGHT (INCHES) = 8.0
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 34

Date: 04/21/2014

File name: LR021077.RFS

Page 33

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH (FEET) = 0.58
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 21.22
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.35
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.54
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.68
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 25.75
   ***STREET FLOWING FULL***
                                                                                   * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.595
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH(FEET) = 0.68
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  HALFSTREET FLOOD WIDTH (FEET) = 26.79
                                                                                       LAND USE
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.24
                                                                                   RESIDENTIAL
                                                                                   "5-7 DWELLINGS/ACRE" A 4.16 0.98 0.500 COMMERCIAL A 5.34 0.98 0.100
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.53
 STREET FLOW TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 24.52
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.642
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   "3-4 DWELLINGS/ACRE" A 0.77 0.98 0.600 32
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.300
 RESIDENTIAL
                                                                                   SUBAREA AREA(ACRES) = 10.27 SUBAREA RUNOFF(CFS) = 12.04
 "5-7 DWELLINGS/ACRE" A 1.53 0.98
                                                 0.500 32
                                                                                   EFFECTIVE AREA(ACRES) = 37.48 AREA-AVERAGED Fm(INCH/HR) = 0.24
                      A 4.98 0.98 0.100 32
 COMMERCIAL
                                                                                   AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.25
 RESIDENTIAL
                                                                                   TOTAL AREA (ACRES) = 37.5 PEAK FLOW RATE (CFS) =
 "3-4 DWELLINGS/ACRE" A 0.48 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.222
                                                                                   5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 SUBAREA AREA (ACRES) = 6.99 SUBAREA RUNOFF (CFS) = 8.97
 EFFECTIVE AREA(ACRES) = 27.21 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.23
                                                                                   DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.16
 TOTAL AREA (ACRES) = 27.2 PEAK FLOW RATE (CFS) =
                                                                                   FLOW VELOCITY (FEET/SEC.) = 4.48 DEPTH*VELOCITY (FT*FT/SEC.) = 2.70
                                                                                   LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21064.00 = 1923.08 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 ******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                                   FLOW PROCESS FROM NODE 21064.00 TO NODE 21065.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.58
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 2.32 DEPTH*VELOCITY (FT*FT/SEC.) = 1.62
                                                                                  >>>> (STREET TABLE SECTION # 18 USED) <<<<
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21063.00 = 1599.50 FEET.
                                                                                 ______
                                                                                   UPSTREAM ELEVATION(FEET) = 1258.00 DOWNSTREAM ELEVATION(FEET) = 1254.00
********************
                                                                                   STREET LENGTH (FEET) = 294.50 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 21063.00 TO NODE 21064.00 IS CODE = 63
                                                                                   STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
______
 UPSTREAM ELEVATION(FEET) = 1265.00 DOWNSTREAM ELEVATION(FEET) = 1258.00
 STREET LENGTH (FEET) = 323.58 CURB HEIGHT (INCHES) = 8.0
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 26.00
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.03
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                    STREET FLOW DEPTH (FEET) = 0.66
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 25.33
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.86
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.91
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.56
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Date: 04/21/2014 File name: LR0210ZZ.RES Page 36

40.87

SCS

32

45.72

50.96

```
STREET FLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 27.03
                                                                                 COMMERCIAL
                                                                                                              5.75 0.98 0.100 32
                                                                                                        Α
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.549
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.231
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
                                                       SCS
                                                                                 SUBAREA AREA(ACRES) = 7.79 SUBAREA RUNOFF(CFS) = 8.11
                                                                                 EFFECTIVE AREA(ACRES) = 55.09 AREA-AVERAGED Fm(INCH/HR) = 0.26
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                               4.73
                                         0.98
                                                0.500
                                                                                 TOTAL AREA (ACRES) = 55.1 PEAK FLOW RATE (CFS) =
                     A
                               3.54
                                                0.100 32
 COMMERCIAL
                       A
                                        0.98
 RESIDENTIAL
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 "3-4 DWELLINGS/ACRE" A 1.55 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.372
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA(ACRES) = 9.82
                              SUBAREA RUNOFF(CFS) = 10.49
                                                                                 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.27
 EFFECTIVE AREA(ACRES) = 47.30 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.24 DEPTH*VELOCITY (FT*FT/SEC.) = 2.81
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
                                                                                 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21066.00 = 3669.58 FEET.
 TOTAL AREA (ACRES) = 47.3 PEAK FLOW RATE (CFS) =
                                                         54.67
                                                                               ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW PROCESS FROM NODE 21066.00 TO NODE 21067.00 IS CODE = 63
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                               _____
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.61
 FLOW VELOCITY (FEET/SEC.) = 3.92 DEPTH*VELOCITY (FT*FT/SEC.) = 2.66
                                                                                 UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21065.00 = 2217.58 FEET.
                                                                                 STREET LENGTH (FEET) = 858.50 CURB HEIGHT (INCHES) = 8.0
                                                                                 STREET HALFWIDTH (FEET) = 26.00
******************
 FLOW PROCESS FROM NODE 21065.00 TO NODE 21066.00 IS CODE = 63
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
______
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1254.00 DOWNSTREAM ELEVATION(FEET) = 1230.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 1452.00 CURB HEIGHT (INCHES) = 8.0
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 27.58
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.81
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.66
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 3.76 Tc (MIN.) = 36.43
                                                                                 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.295
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fp
   STREET FLOW DEPTH (FEET) = 0.67
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 26.17
                                                                                 COMMERCIAL
                                                                                                              1.85
                                                                                                                        0.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.29
                                                                                 RESIDENTIAL.
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.89
                                                                                 "3-4 DWELLINGS/ACRE"
                                                                                                    B 0.05
                                                                                                                        0.75 0.600
                                                                                                     A
 STREET FLOW TRAVEL TIME (MIN.) = 5.64 Tc (MIN.) = 32.67
                                                                                                               0.62
                                                                                                                        0.98 0.100
                                                                                 COMMERCIAL
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.383
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.110
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                       SCS
                                                                                 SUBAREA AREA (ACRES) = 2.52 SUBAREA RUNOFF (CFS) = 2.74
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.25
     LAND USE
 RESIDENTIAL
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.26
 "3-4 DWELLINGS/ACRE" A
                                2.04
                                        0.98
                                                0.600 32
                                                                                 TOTAL AREA (ACRES) = 57.6 PEAK FLOW RATE (CFS) = 55.70
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 37 File name: LR0210ZZ.RES

Date: 04/21/2014

55.70

57.07

αA

0.100

Page 38

```
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                DEPTH OF FLOW IN 84.0 INCH PIPE IS 48.3 INCHES
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                               PIPE-FLOW VELOCITY(FEET/SEC.) = 7.55
                                                                                PIPE-FLOW(CFS) = 172.87
                                                                               *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.40
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 3.17 Tc (MIN.) = 22.12
 FLOW VELOCITY (FEET/SEC.) = 3.76 DEPTH*VELOCITY (FT*FT/SEC.) = 2.62
                                                                                * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.747
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fр
******************
                                                                                   LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 7.32
                                                                                                                      0.98 0.600
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 5.09
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
                                                                                                                      0.75 0.600
______
                                                                                COMMERCIAL
                                                                                                    A 15.30
                                                                                                                      0.98 0.100
 TOTAL NUMBER OF STREAMS = 2
                                                                                COMMERCIAL
                                                                                                      В
                                                                                                            41.62
                                                                                                                      0.75 0.100
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 TIME OF CONCENTRATION (MIN.) = 36.43
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
 RAINFALL INTENSITY (INCH/HR) = 1.30
                                                                                SUBAREA AREA(ACRES) = 69.33
                                                                                                            SUBAREA RUNOFF(CFS) = 98.95
 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                                EFFECTIVE AREA(ACRES) = 184.22 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.97
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.24
 AREA-AVERAGED Ap = 0.26
                                                                                TOTAL AREA (ACRES) = 211.9 PEAK FLOW RATE (CFS) = 252.93
 EFFECTIVE STREAM AREA(ACRES) = 57.61
 TOTAL STREAM AREA(ACRES) = 57.61
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 55.70
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
 ** CONFLUENCE DATA **
                                                                                STREET CROSS-SECTION INFORMATION:
                                                                                CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          126.63 18.95 1.917 0.93(0.26) 0.28 84.9 21050.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
    2
          55.70 36.43 1.295 0.97(0.25) 0.26 57.6 21060.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 ** PEAK FLOW RATE TABLE **
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
   1 172.87 18.95 1.917 0.94(0.26) 0.27 114.9 21050.00
                                                                                STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 80.07
    2 134.82 36.43 1.295 0.95(0.26) 0.27 142.5 21060.00
                                                                                 ***STREET FLOWING FULL***
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                 STREET FLOW DEPTH(FEET) = 1.00
 PEAK FLOW RATE (CFS) = 172.87 Tc (MIN.) = 18.95
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 55.72
 EFFECTIVE AREA(ACRES) = 114.89 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.94
 AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.27
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.94
 TOTAL AREA (ACRES) = 142.5
                                                                                *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
                                                                                     AND L = 1347.9 FT WITH ELEVATION-DROP = 2.5 FT, IS 109.0 CFS,
                                                                                     WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21068.00
******************
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21068.00 IS CODE = 33
                                                                                ** PEAK FLOW RATE TABLE **
-----
                                                                                STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 1
                                                                                         252.93 22.12 1.747 0.92(0.22) 0.24 184.2 21050.00
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                  2 191.26 39.78 1.228 0.92(0.23) 0.24 211.9 21060.00
_____
 UPSTREAM NODE ELEVATION (FEET) = 1220.00
                                                                                NEW PEAK FLOW DATA ARE:
 DOWNSTREAM NODE ELEVATION (FEET) = 1217.50
                                                                                PEAK FLOW RATE (CFS) = 252.93 Tc (MIN.) = 22.12
 FLOW LENGTH (FEET) = 1347.88 MANNING'S N = 0.013
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp(INCH/HR) = 0.92
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Date: 04/21/2014 Page 40 File name: LR021077.RFS

56

```
LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21068.00 = 5875.96 FEET.
                                                                                       Q Tc Intensity Fp(Fm)
                                                                                                                      Ap Ae
                                                                                                                                    HEADWATER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
283.64 24.43 1.646 0.92(0.20)0.22 218.6 21050.00
                                                                                        216.17 42.25 1.185 0.92(0.21) 0.23 246.2 21060.00
 FLOW PROCESS FROM NODE 21068.00 TO NODE 21069.00 IS CODE = 33
                                                                               NEW PEAK FLOW DATA ARE:
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                               PEAK FLOW RATE (CFS) = 283.64 Tc (MIN.) = 24.43
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.20 AREA-AVERAGED Fp(INCH/HR) = 0.92
AREA-AVERAGED Ap = 0.22 EFFECTIVE AREA(ACRES) = 218.56
 UPSTREAM NODE ELEVATION (FEET) = 1217.50
                                                                               LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
 DOWNSTREAM NODE ELEVATION (FEET) = 1215.00
                                                                             ******************
 FLOW LENGTH (FEET) = 1146.78 MANNING'S N = 0.013
                                                                               FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 11
 USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
                                                                             ______
 DEPTH OF FLOW IN 93.0 INCH PIPE IS 54.4 INCHES
                                                                               >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.82
                                                                             ______
 PIPE-FLOW(CFS) = 252.93
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                               ** MAIN STREAM CONFLUENCE DATA **
 PIPEFLOW TRAVEL TIME (MIN.) = 2.31 Tc (MIN.) = 24.43
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                       (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.646
                                                                               NUMBER
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                1
                                                                                        283.64 24.43 1.646 0.92(0.20) 0.22 218.6 21050.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                                                        216.17 42.25 1.185 0.92 (0.21) 0.23 246.2 21060.00
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             1.21
                                     0.75
                                               0.600 56
                                                                               ** MEMORY BANK # 1 CONFLUENCE DATA **
 COMMERCIAL
                                                                               PEAK FLOW RATE (CFS) = 4925.52 Tc (MIN.) = 55.70
                             33.09
                                               0.100 32
                      A
                                       0.98
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.51 Ybar = 0.54
 PUBLIC PARK
                      В
                             0.04
                                       0.75 0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
                                                                               TOTAL AREA(ACRES) = 10647.2
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118
 SUBAREA AREA(ACRES) = 34.34 SUBAREA RUNOFF(CFS) = 47.45
 EFFECTIVE AREA(ACRES) = 218.56 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                               COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.26
                                                                               UNIT-HYDROGRAPH DATA:
 TOTAL AREA (ACRES) = 246.2 PEAK FLOW RATE (CFS) = 277.38
                                                                               RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.01;3H= 1.74;6H= 2.45;24H= 5.31
                                                                               S-GRAPH: VALLEY(DEV.) = 71.4%; VALLEY(UNDEV.) / DESERT = 28.6%
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26
                                                                               Tc(HR) = 0.93; LAG(HR) = 0.74; Fm(INCH/HR) = 0.50; Ybar = 0.53
                                                                               USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 STREET CROSS-SECTION INFORMATION:
                                                                               DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.66; 1HR = 0.67;
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
                                                                               3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                               UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10893.4
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                               EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               Lca/L=0.3,n=.0269; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221; Lca/L=0.6,n=.0206
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                               TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 2278.53
                                                                               PEAK FLOW RATE (CFS) = 4899.61
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               (UPSTREAM NODE PEAK FLOW RATE (CFS) = 4925.52)
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               PEAK FLOW RATE (CFS) USED = 4925.52
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                             STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 24.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 12
  STREET FLOW DEPTH (FEET) = 0.70
  HALFSTREET FLOOD WIDTH (FEET) = 28.91
                                                                               >>>>CLEAR MEMORY BANK # 1 <<<<
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.61
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.13
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                             AND L = 1146.8 FT WITH ELEVATION-DROP = 2.5 FT, IS 59.1 CFS,
                                                                               FLOW PROCESS FROM NODE 21069.00 TO NODE 21070.00 IS CODE = 54
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21069.00
                                                                               >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

\*\* PEAK FLOW RATE TABLE \*\*

AREA-AVERAGED Ap = 0.24 EFFECTIVE AREA(ACRES) = 184.22

Date: 04/21/2014 File name: LR0210ZZ.RES Page 41 Date: 04/21/2014 File name: LR0210ZZ.RES Page 42

File name: LR0210ZZ.RES

Page 43

Date: 04/21/2014

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2012 Advanced Engineering Software (aes) Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21167

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0211ZZ.DAT

TIME/DATE OF STUDY: 08:04 11/19/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF- CROWN TO		CROWN TO STREET-CROSSFALL:		GUTTER-GEOMETRIES:			MANNING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR	
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====	=======	=======================================	=====	=====	=====	=====	======	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

17 18 19	20.0 26.0 52.0	10.0 15.0 20.0	0.020/0.020/ 0.020/0.020/ 0.020/0.020/	0.020	0.50 0.67 0.67	1.50 2.00 2.00	0.0312 ( 0.0312 ( 0.0312 (	0.125 0.167 0.167	0.0180 0.0180 0.0180
1. 2. *SIZ OR	Relativ as (Max (Depth) E PIPE W EQUAL TO	e Flow-D imum All *(Veloci ITH A FL THE UPS	EPTH CONSTRAI epth = 0.20 owable Street ty) Constrain OW CAPACITY G TREAM TRIBUTA MUM TOPOGRAPH	FEET Flow D t = 6. REATER RY PIPE	O (FT*FT, THAN .*	/S)		CTED	
WA US 1 FC PF SI	ATERSHED SED "VALL UNITS/AC OR DEVELO RECIPITAT ERRA MAD	LAG = 0. EY UNDEV RE AND L PMENTS O ION DATA RE DEPTH	L SELECTIONS/ 80 * Tc ELOPED" S-GRA ESS; AND "VAL F 2 UNITS/ACR ENTERED ON S -AREA FACTORS CONDITION (AM	APH FOR LEY DEV E AND M SUBAREA SUSED.	DEVELOPMI ELOPED" S ORE. BASIS.	S-GRAF	Н	GRAPH :	METHOD*
			************* DE 21100.00						*****
>>US	SE TIME-O	F-CONCEN	INITIAL SUBA	RAPH FO	R INITIA	L SUBA			
ELEV TC = SUBA * 2 SUBA DEV	"ATION DA  "K*[(LEN AREA ANAL 5 YEAR R AREA TC A "ELOPMENT LAND US TDENTIAL	TA: UPST GTH** 3. YSIS USE AINFALL ND LOSS TYPE/ E	-LENGTH (FEET) REAM (FEET) =  00) / (ELEVATIO D MINIMUM TC ( INTENSITY (INC RATE DATA (AMC SCS SOIL GROUP	1870.  ON CHANG MIN.) = CH/HR) = CH/HR): AREA (ACRES)	00 DOWNS E)]**0.20 9.418 2.916  Fp (INCH/H	) 8 HR) (	Ap DECIMAL	SCS ) CN	Tc (MIN.)
RESI "2 E SUBA SUBA SUBA	DENTIAL DWELLINGS AREA AVER AREA AVER	/ACRE" AGE PERV AGE PERV FF(CFS)	B  IOUS LOSS RAT  IOUS AREA FRA  = 16.15	6.56 E, Fp(I	0.7 NCH/HR) = Ap = 0.6	75 = 0.7 688	0.700	56	
SUBA 5M =	AREA AREA = 0.36; 3	-AVERAGE OM = 0.7	7.47 P D RAINFALL DE 3; 1HR = 0.96	SPTH(INC ; 3HR =	Н): 1.56; бы	HR = 2	1.12; 24	HR = 4	
FLOW	PROCESS	FROM NO	DE 21101.00	TO NODE	21102.0	00 IS	CODE =	54	
>>>>	>TRAVELT	IME THRU	IDAL CHANNEL SUBAREA (EXI	STING E	LEMENT) <				
ELEV CHAN	ATION DA	TA: UPST TH THRU	======================================	1820. = 73	00 DOWNS 3.55 CH	STREAM HANNEI		= 17	70.00

File name: LR0211ZZ.RES

Page 2

Date: 04/21/2014

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            16.15
 FLOW VELOCITY (FEET/SEC.) = 4.72 FLOW DEPTH (FEET) = 0.83
 TRAVEL TIME (MIN.) = 2.59 Tc (MIN.) = 12.01
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21102.00 = 1411.86 FEET.
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21102.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 12.01
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.521
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                           Ар
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 10.44
                                 0.75
                                          0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.19
                                 0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 12.63
                           SUBAREA RUNOFF (CFS) = 22.85
 EFFECTIVE AREA(ACRES) = 20.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 20.1 PEAK FLOW RATE (CFS) =
                                                 36.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21103.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1750.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 514.94 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 36.34
 FLOW VELOCITY (FEET/SEC.) = 4.68 FLOW DEPTH (FEET) = 1.25
 TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 13.84
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21103.00 = 1926.80 FEET.
********************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21103.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 13.84
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.314
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                           Ар
                                                SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                          1.23
                                   0.75
                                          0.600
                                               56
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                          8.43 0.75 0.700 56
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA (ACRES) = 9.66 SUBAREA RUNOFF (CFS) = 15.65
 EFFECTIVE AREA(ACRES) = 29.76 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 29.8
                             PEAK FLOW RATE(CFS) =
                                                  48.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21104.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1715.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.67 CHANNEL SLOPE = 0.0530
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 48.26
 FLOW VELOCITY (FEET/SEC.) = 5.65 FLOW DEPTH (FEET) = 1.31
 TRAVEL TIME (MIN.) = 1.95 Tc (MIN.) = 15.79
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21104.00 = 2587.47 FEET.
*******************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21104.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 15.79
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.138
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                         Ар
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   в 20.18
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 4.62
                                           0.600
                                                  56
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
 SUBAREA AREA(ACRES) = 24.80 SUBAREA RUNOFF(CFS) = 36.36
 EFFECTIVE AREA(ACRES) = 54.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 54.6 PEAK FLOW RATE (CFS) =
                                                 79.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21105.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH (FEET) = 402.43 CURB HEIGHT (INCHES) = 8.0
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 3

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   84.28
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.96
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 18.65
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.935
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                               Дp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.35 0.75 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.77 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA(ACRES) = 6.12 SUBAREA RUNOFF(CFS) = 7.83
 EFFECTIVE AREA(ACRES) = 64.31 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 64.3 PEAK FLOW RATE (CFS) =
                                                         82.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.22
 FLOW VELOCITY (FEET/SEC.) = 5.65 DEPTH*VELOCITY (FT*FT/SEC.) = 3.90
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21106.00 = 3552.21 FEET.
******************
 FLOW PROCESS FROM NODE 21106.00 TO NODE 21107.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1690.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 483.05 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   86.87
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

File name: LR0211ZZ.RES

Page 6

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014

Date: 04/21/2014 File name: LR0211ZZ.RES Page 5

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
STREET FLOW DEPTH(FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.70
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.42
 STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 19.85
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.864
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
  DEVELOPMENT TYPE/
                                        Fρ
                                                 Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 6.11 0.75 0.700 56
 RESIDENTIAL
                     B 1.21 0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 7.32 SUBAREA RUNOFF (CFS) = 8.91
 EFFECTIVE AREA(ACRES) = 71.63 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 71.6 PEAK FLOW RATE (CFS) = 87.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.15
 FLOW VELOCITY (FEET/SEC.) = 6.69 DEPTH*VELOCITY (FT*FT/SEC.) = 4.43
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21107.00 = 4035.26 FEET.
*******************
 FLOW PROCESS FROM NODE 21107.00 TO NODE 21108.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 579.31 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.61
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.67
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.20
 STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 21.11
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.797
 SUBAREA LOSS RATE DATA (AMC II):
```

DEVELOPMENT TYPE/	SCS SOTI	AREA	Fn	An	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
RESIDENTIAL					
"2 DWELLINGS/ACRE"	В	28.69	0.75	0.700	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"					56
SUBAREA AVERAGE PERVIOUS				.75	
SUBAREA AVERAGE PERVIOUS				۵۱ ۵۵	2.0
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) =					
AREA-AVERAGED Fp(INCH/H)					- 0.31
TOTAL AREA (ACRES) =	105.6	PEA	K FLOW RATE	(CFS) =	122.15
,				, ,	
SUBAREA AREA-AVERAGED R	AINFALL D	EPTH (INCH	):		
5M = 0.36; 30M = 0.73;	1HR = 0.9	6; 3HR =	1.56; 6HR =	2.12; 24H	R = 4.26
END OF SUBAREA STREET F					
DEPTH (FEET) = $0.70$ HA					
FLOW VELOCITY (FEET/SEC.					
LONGEST FLOWPATH FROM NO	JDE ZIIU	0.00 TO N	ODE 21108.	00 = 46.	14.5/ FEET.
******	******	*****	******	*****	*****
FLOW PROCESS FROM NODE	21108.00	TO NODE	21109.00 I	S CODE =	63
>>>>COMPUTE STREET FLOW	W TRAVEL	TIME THRU	SUBAREA<<<	<<	
>>>> (STREET TABLE SECT					
UPSTREAM ELEVATION (FEET					= 1600.00
STREET LENGTH (FEET) =	1132.55	COKR HET	GHT (INCHES)	= 8.0	
conser intematent/seem) .	- 26 00				
STREET HALFWIDTH (FEET)	= 26.00				
		. GRADEBRE	AK(FEET) =	15.00	
STREET HALFWIDTH (FEET) :  DISTANCE FROM CROWN TO ( INSIDE STREET CROSSFALL	CROSSFALL			15.00	
DISTANCE FROM CROWN TO	CROSSFALL (DECIMAL)	= 0.020		15.00	
DISTANCE FROM CROWN TO O	CROSSFALL (DECIMAL)	= 0.020		15.00	
DISTANCE FROM CROWN TO OURSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALESPECIFIED NUMBER OF HALE	CROSSFALL (DECIMAL) L(DECIMAL FSTREETS	= 0.020 J) = 0.0 CARRYING	20 RUNOFF = 2	15.00	
DISTANCE FROM CROWN TO OURSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALE	CROSSFALL (DECIMAL) L(DECIMAL FSTREETS L(DECIMAL	= 0.020 a) = 0.0 CARRYING a) = 0.0	20 RUNOFF = 2 20		
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR	CROSSFALI (DECIMAL) L(DECIMAI FSTREETS L(DECIMAI OR for St	= 0.020 a) = 0.0 CARRYING a) = 0.0 creetflow	20  RUNOFF = 2 20  Section(cur	b-to-curb)	
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR Manning's FRICTION FACTOR	CROSSFALI (DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL DR for St DR for Ba	CARRYING  c) = 0.020  CARRYING  c) = 0.0  creetflow  ck-of-Wal	20  RUNOFF = 2 20  Section(cur k Flow Sect	b-to-curb)	
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR	CROSSFALI (DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL DR for St DR for Ba	CARRYING  c) = 0.020  CARRYING  c) = 0.0  creetflow  ck-of-Wal	20  RUNOFF = 2 20  Section(cur k Flow Sect	b-to-curb)	
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR MAXIMUM ALLOWABLE STREET	CROSSFALL (DECIMAL) L(DECIMAL FSTREETS L(DECIMAL DR for St DR for Ba I FLOW DE	CARRYING  c) = 0.0  Caretflow  ck-of-Wal  CPTH (FEET)	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR Manning's FRICTION FACTOR	CROSSFALL (DECIMAL) L(DECIMAL FSTREETS L(DECIMAL DR for St DR for Ba I FLOW DE D USING E	CARRYING  c) = 0.0  Caretflow  ck-of-Wal  CPTH (FEET)	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO OURSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR MAXIMUM ALLOWABLE STREES **TRAVEL TIME COMPUTE!	CROSSFALL (DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL DR for St DR for Ba I FLOW DE D USING E L***	= 0.020 carrying d) = 0.0 creetflow ack-of-Wal creffication creetflow ck-of-Wal	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) =	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO OUR INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALE STREET PARKWAY CROSSFALE Manning's FRICTION FACTOR MAXIMUM ALLOWABLE STREES **TRAVEL TIME COMPUTED ***STREET FLOWING FULL	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL FSTREETS L(DECIMAL DR for St DR for Ba I FLOW DE D USING E L*** LTS USING	= 0.020 CARRYING D) = 0.0 Creetflow Ck-of-Wal CPTH(FEET) CSTIMATED	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) =	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALE Manning's FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE! ***STREET FLOWING FULL STREETFLOW MODEL RESULUTE STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTS	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St DR for Ba I FLOW DE D USING E L*** LTS USING I) = 0.7 H(FEET) =	= 0.020 CARRYING () = 0.0 reetflow cck-of-Wal PPTH (FEET) STIMATED ESTIMATE 5 30.39	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW:	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALE Manning's FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTED ***STREET FLOW MODEL RESULUTION STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTHAVERAGE FLOW VELOCITY	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St DR for Ba I FLOW DE D USING E L*** LTS USING T) = 0.7 H(FEET) = (FEET/SEC	= 0.020 CARRYING  ) = 0.0 creetflow cck-of-Wal EPTH(FEET) CSTIMATED  GESTIMATE	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW:	b-to-curb) ion = 0.0	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALE SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALMANNING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTED ***STREET FLOWING FULL STREETFLOW MODEL RESULUTION STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTHAVERAGE FLOW VELOCITY PRODUCT OF DEPTH&VELOOD	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St OR for Ba I FLOW DE D USING E L*** LTS USING T) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F	= 0.020 CARRYING ) = 0.0 creetflow ck-of-Wal PTH(FEET) STIMATED ESTIMATE  3 0.39 C) = 7 T/SEC.) =	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW:	b-to-curb) ion = 0.0 134.5	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALT SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALT Manning's FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTED ***STREET FLOWING FULL STREETFLOW MODEL RESUUNT STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTHAVERAGE FLOW VELOCITY PRODUCT OF DEPTH&VELOUSTREET FLOW TRAVEL TIME	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St OR for Ba I FLOW DE D USING E L*** LTS USING T) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) =	= 0.020 CARRYING ) = 0.0 creetflow cck-of-Wal PTH(FEET) STIMATED SESTIMATED SESTIMATE SESTIMATE To sest the sest that the sest t	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW: .37 5.56 Tc(MIN.) =	b-to-curb) ion = 0.0 134.5	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALT SPECIFIED NUMBER OF HALT STREET PARKWAY CROSSFALT MANNING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTED ***STREET FLOW MODEL RESUUT STREET FLOW DEPTH (FEET HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH&VELOUSTREET FLOW TRAVEL TIME * 25 YEAR RAINFALL INTER * 25 YEAR * 25 YEA	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St OR for Ba I FLOW DE D USING E L*** LTS USING F) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN	= 0.020 CARRYING  ) = 0.0 creetflow cck-of-Wall PTH(FEET) CSTIMATED  GESTIMATED  : 30.39 :) = 7 TT/SEC.) = 2.56 ICH/HR) =	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW: .37 5.56 Tc(MIN.) =	b-to-curb) ion = 0.0 134.5	0200
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALMANNING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE! ***STREET FLOW MODEL RESULUTE STREETFLOW MODEL RESULUTE STREETFLOW MODEL RESULUTE FLOW VELOCITY PRODUCT OF DEPTH&VELOCITY PRODUCT OF DEPTH&VELOCUTY PRODUCT OF DEPTH	CROSSFALL (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL) OR for St OR for Ba F FLOW DE D USING E L*** LTS USING F) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II):	= 0.020 CARRYING D) = 0.0 Creetflow CCARRYING CONTROL	20  RUNOFF = 2 20  Section(cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37	b-to-curb) ion = 0.0  134.50	0200
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALM MANING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET '*TRAVEL TIME COMPUTED'***STREET FLOW MODEL RESULUTION STREET FLOW DEPTH (FEE' HALFSTREET FLOW DEPTH (FEE' HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH&VELOUSTREET FLOW TRAVEL TIME '25 YEAR RAINFALL INTUSUBAREA LOSS RATE DATA (DEVELOPMENT TYPE/	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL OR for St DOR for Ba F FLOW DE USING F L*** LTS USING F) = 0.7 H(FEET) = (FEET/SEC CIMYIN.) = ENSITY(IN AMC II): SCS SOIL	= 0.020 CARRYING D) = 0.0 Creetflow CCARRYING CONTROL	20  RUNOFF = 2 20  Section(cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37 5.56  Tc(MIN.) = 1.677  Fp	b-to-curb) ion = 0.1  134.50  23.67	0200 6 SCS
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALM MANING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET '*TRAVEL TIME COMPUTED'***STREET FLOW MODEL RESULUTION STREET FLOW DEPTH (FEE' HALFSTREET FLOW DEPTH (FEE' HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH&VELOUSTREET FLOW TRAVEL TIME '25 YEAR RAINFALL INTUSUBAREA LOSS RATE DATA (DEVELOPMENT TYPE/	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL OR for St DOR for Ba F FLOW DE USING F L*** LTS USING F) = 0.7 H(FEET) = (FEET/SEC CIMYIN.) = ENSITY(IN AMC II): SCS SOIL	= 0.020 CARRYING D) = 0.0 Creetflow CCARRYING CONTROL	20  RUNOFF = 2 20  Section(cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37	b-to-curb) ion = 0.1  134.50  23.67	0200 6 SCS
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALM MANNING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTED ***STREET FLOW MODEL RESULUTED STREET FLOW DEPTH (FEET HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH VELOCITY PRODUCT OF DEPTH VELOCUTY PR	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) FSTREETS L(DECIMAL OR for St DOR for Ba I FLOW DE USING E L*** LTS USING I) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II): SCS SOIL GROUP	CARRYING  CARRYING  CONTROL  C	RUNOFF = 2 20 Section(cur k Flow Sect = 0.80 FLOW(CFS) = D FLOW: .37 5.56 Tc(MIN.) = 1.677 Fp(INCH/HR)	b-to-curb) ion = 0.1  134.5	0200 6 SCS CN
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALD SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALD MANINING'S FRICTION FACTOR MAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE:  **TRAVEL TIME COMPUTE:  **STREET FLOW MODEL RESULUTED STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTHAVERAGE FLOW VELOCITY PRODUCT OF DEPTHAVELOUSTREET FLOW TRAVEL TIME  * 25 YEAR RAINFALL INTISUBAREA LOSS RATE DATA (INTISUBAREA LOSS RATE DATA (INTISUBA	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) ESTREETS L(DECIMAL) OR for St OR for Ba I FLOW DE USING E L*** LTS USING I) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II): SCS SOII GROUP B	= 0.020 CARRYING a) = 0.0 CARRYING c) = 0.0 Creetflow cck-of-Wal CPTH (FEET) CSTIMATED CSTIMATED CSTIMATE CSTIM	20  RUNOFF = 2 20  Section (cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37	b-to-curb) ion = 0.0  134.5  23.67  Ap (DECIMAL) 0.700	0200 6 SCS CN 56
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALL STREET PARKWAY CROSSFALM MANING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE! ***STREET FLOW MODEL RESULUTE STREET FLOW DEPTH (FEET HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH EVELOUSTREET FLOW TRAVEL TIME * 25 YEAR RAINFALL INTENTION SUBAREA LOSS RATE DATA (INDICATED CONTINUE OF THE STREET FLOW TRAVEL TIME * 25 YEAR RAINFALL INTENTION OF THE SUBAREA LOSS RATE DATA (INDICATED CONTINUE OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL LOSS RATE DATA (INDICATED CONTINUE OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE * 25 YEAR RAINFALL INTENTIO	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) ESTREETS L(DECIMAL OR for St OR for Ba I FLOW DE USING E L*** LTS USING I) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II): SCS SOII GROUP B B	= 0.020 CARRYING ) = 0.0 CRESTINATE CRESTIMATED CRES	20  RUNOFF = 2 20  Section(cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37 5.56  Tc(MIN.) = 1.677  Fp (INCH/HR) 0.75 0.75	b-to-curb) ion = 0.0  134.50  23.67  Ap (DECIMAL) 0.700 0.600	0200 6 SCS CN 56
DISTANCE FROM CROWN TO OUTSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALD SPECIFIED NUMBER OF HALL STREET PARKWAY CROSSFALD MANINING'S FRICTION FACTOR MAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE:  **TRAVEL TIME COMPUTE:  **STREET FLOW MODEL RESULUTED STREET FLOW DEPTH (FEETHALFSTREET FLOOD WIDTHAVERAGE FLOW VELOCITY PRODUCT OF DEPTHAVELOUSTREET FLOW TRAVEL TIME  * 25 YEAR RAINFALL INTISUBAREA LOSS RATE DATA (INTISUBAREA LOSS RATE DATA (INTISUBA	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) ESTREETS L(DECIMAL OR for St OR for Ba I FLOW DE USING E L*** LTS USING I) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II): SCS SOII GROUP B B	= 0.020 CARRYING ) = 0.0 CRESTINATE CRESTIMATED CRES	20  RUNOFF = 2 20  Section(cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37 5.56  Tc(MIN.) = 1.677  Fp (INCH/HR) 0.75 0.75	b-to-curb) ion = 0.0  134.50  23.67  Ap (DECIMAL) 0.700 0.600	0200 6 SCS CN 56
DISTANCE FROM CROWN TO INSIDE STREET CROSSFALL OUTSIDE STREET CROSSFALL STREET PARKWAY CROSSFALL STREET PARKWAY CROSSFALM MANING'S FRICTION FACTOMAXIMUM ALLOWABLE STREET **TRAVEL TIME COMPUTE! ***STREET FLOW MODEL RESULUTE STREET FLOW DEPTH (FEET HALFSTREET FLOW VELOCITY PRODUCT OF DEPTH EVELOUSTREET FLOW TRAVEL TIME * 25 YEAR RAINFALL INTENTION SUBAREA LOSS RATE DATA (INDICATED CONTINUE OF THE STREET FLOW TRAVEL TIME * 25 YEAR RAINFALL INTENTION OF THE SUBAREA LOSS RATE DATA (INDICATED CONTINUE OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL LOSS RATE DATA (INDICATED CONTINUE OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE SUBARBAL STREET FLOW TRAVEL THE * 25 YEAR RAINFALL INTENTION OF THE * 25 YEAR RAINFALL INTENTIO	CROSSFALI (DECIMAL) L(DECIMAL) L(DECIMAL) ESTREETS L(DECIMAL OR for St DOR for Ba I FLOW DE USING E L*** LTS USING I) = 0.7 H(FEET) = (FEET/SEC CITY(FT*F (MIN.) = ENSITY(IN AMC II): SCS SOII GROUP B B S LOSS RA	= 0.020 CARRYING ) = 0.0 CRESTINATE CRESTIMATED CRES	20  RUNOFF = 2 20  Section (cur k Flow Sect = 0.80  FLOW(CFS) =  D FLOW:  .37 5.56  Tc(MIN.) = 1.677  Fp (INCH/HR) 0.75 0.75 CH/HR) = 0	b-to-curb) ion = 0.0  134.50  23.67  Ap (DECIMAL) 0.700 0.600	0200 6 SCS CN 56

File name: LR0211ZZ.RES

Page 8

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 23.76 SUBAREA RUNOFF (CFS) = 24.83
 EFFECTIVE AREA(ACRES) = 129.38 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 129.4 PEAK FLOW RATE (CFS) = 135.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 30.51
 FLOW VELOCITY(FEET/SEC.) = 7.37 DEPTH*VELOCITY(FT*FT/SEC.) = 5.58
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21109.00 = 5747.12 FEET.
*****
 FLOW PROCESS FROM NODE 21109.00 TO NODE 21110.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1550.00
 STREET LENGTH (FEET) = 761.67 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 139.58
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.43
 STREET FLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 25.06
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.621
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                 Αp
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В 6.59
                                      0.75
                                                0.700
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B
                              1.29
                                      0.75
                                                0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA(ACRES) = 7.88 SUBAREA RUNOFF(CFS) = 7.87
 EFFECTIVE AREA(ACRES) = 137.26 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 137.3 PEAK FLOW RATE (CFS) = 136.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.71
 FLOW VELOCITY (FEET/SEC.) = 9.05 DEPTH*VELOCITY (FT*FT/SEC.) = 6.34
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.01
 PIPE-FLOW(CFS) = 53.49
 PIPEFLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 24.42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.646
 SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 8.05
 TOTAL AREA (ACRES) = 137.3 PEAK FLOW RATE (CFS) = 140.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 22.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.90
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21110.00 = 6508.79 FEET.
******************
 FLOW PROCESS FROM NODE 21110.00 TO NODE 21129.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1495.00
 FLOW LENGTH (FEET) = 1519.57 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 24.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 21.88
 PIPE-FLOW(CFS) = 140.09
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 25.58
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
*****************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 25.58
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.601
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fp
                                                      SCS
                                              Aр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 9

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 10

```
"3-4 DWELLINGS/ACRE" B 21.30 0.75 0.600 56
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AREA (ACRES) = 21.30 SUBAREA RUNOFF (CFS) = 22.09
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
 EFFECTIVE AREA(ACRES) = 158.56 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 158.6
                             PEAK FLOW RATE (CFS) = 156.61
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                            21.83
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              STREET FLOW DEPTH (FEET) = 0.41
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 14.05
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.22
*****************
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.12
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 10
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 4.22 Tc (MIN.) = 15.47
                                                                             * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.165
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
******************
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" B 0.67 0.75 0.600
 FLOW PROCESS FROM NODE 21121.00 TO NODE 21122.00 IS CODE = 21
                                                                             RESIDENTIAL
                                                                             "2 DWELLINGS/ACRE" B 10.86 0.75 0.700
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
______
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 969.86
                                                                             SUBAREA AREA (ACRES) = 11.53 SUBAREA RUNOFF (CFS) = 17.08
 ELEVATION DATA: UPSTREAM(FEET) = 1830.00 DOWNSTREAM(FEET) = 1770.00
                                                                             EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                             TOTAL AREA(ACRES) = 18.5 PEAK FLOW RATE(CFS) =
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.254
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.621
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                                                             5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fp
                                                    SCS Tc
                                            Ар
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                             END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                                                                             DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 15.38
 "3-4 DWELLINGS/ACRE" B 1.27 0.75 0.600
                                                   56 11.25
                                                                             FLOW VELOCITY (FEET/SEC.) = 5.53 DEPTH*VELOCITY (FT*FT/SEC.) = 2.40
 RESIDENTIAL
                                                                             LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21123.00 = 2288.83 FEET.
                     в 5.70
 "2 DWELLINGS/ACRE"
                                    0.75 0.700
                                                   56 11.96
                                                                           ******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                                                                             FLOW PROCESS FROM NODE 21123.00 TO NODE 21124.00 IS CODE = 63
                                                                           ______
 SUBAREA RUNOFF (CFS) = 13.24
 TOTAL AREA (ACRES) = 6.97 PEAK FLOW RATE (CFS) = 13.24
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
                                                                           _____
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                             UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
                                                                             STREET LENGTH (FEET) = 1863.96 CURB HEIGHT (INCHES) = 6.0
*******************
                                                                             STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21122.00 TO NODE 21123.00 IS CODE = 63
______
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
______
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 1318.97 CURB HEIGHT (INCHES) = 6.0
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 47.38
```

Page 11

Date: 04/21/2014

File name: LR0211ZZ.RES

56

56

27.46

Page 12

RESIDENTIAL.

Date: 04/21/2014

File name: LR0211ZZ.RES

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 19.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.09
 STREET FLOW TRAVEL TIME (MIN.) = 5.24 Tc (MIN.) = 20.71
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.818
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.04
                                          0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 29.70 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA(ACRES) = 33.74 SUBAREA RUNOFF(CFS) = 39.56
 EFFECTIVE AREA(ACRES) = 52.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 52.2 PEAK FLOW RATE (CFS) = 61.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.88
 FLOW VELOCITY (FEET/SEC.) = 6.48 DEPTH*VELOCITY (FT*FT/SEC.) = 3.61
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1864.0 FT WITH ELEVATION-DROP = 75.0 FT, IS 49.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21124.00
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21124.00 = 4152.79 FEET.
******************
 FLOW PROCESS FROM NODE 21124.00 TO NODE 21125.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 472.91 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     63.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.99
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.18
 STREET FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 21.69
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.768
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.00 0.75
                                                  0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.67 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 4.67 SUBAREA RUNOFF (CFS) = 5.27
 EFFECTIVE AREA(ACRES) = 56.91 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 56.9 PEAK FLOW RATE (CFS) = 64.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 19.05
 FLOW VELOCITY (FEET/SEC.) = 8.03 DEPTH*VELOCITY (FT*FT/SEC.) = 4.18
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21125.00 = 4625.70 FEET.
******************
 FLOW PROCESS FROM NODE 21125.00 TO NODE 21126.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH (FEET) = 502.51 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.67
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.81
 STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 22.95
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.709
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                         SCS
                                                Дp
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 14

```
RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.19
                                     0.75
                                             0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                            1.64 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AREA(ACRES) = 5.83 SUBAREA RUNOFF(CFS) = 6.33
 EFFECTIVE AREA(ACRES) = 62.74 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 62.7 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.67
 FLOW VELOCITY (FEET/SEC.) = 6.66 DEPTH*VELOCITY (FT*FT/SEC.) = 3.82
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.
********************
 FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 22.95
 RAINFALL INTENSITY (INCH/HR) = 1.71
 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 62.74
 TOTAL STREAM AREA(ACRES) = 62.74
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 67.49
******************
 FLOW PROCESS FROM NODE 21150.00 TO NODE 21151.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 912.75
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1685.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.318
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.268
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                             Ap SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.53
                                                  56 15.22
                                     0.75
                                             0.700
 RESIDENTIAL
                           0.32 0.75 0.600
                                                  56 14.32
 "3-4 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA RUNOFF (CFS) = 10.78
 TOTAL AREA (ACRES) = 6.85 PEAK FLOW RATE (CFS) = 10.78
```

```
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21151.00 TO NODE 21152.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1685.00 DOWNSTREAM ELEVATION(FEET) = 1630.00
 STREET LENGTH (FEET) = 659.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.59
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    19.70
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.37
   HALFSTREET FLOOD WIDTH (FEET) = 12.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.08
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.26
 STREET FLOW TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 16.13
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.112
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                         SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 10.34 0.75 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.04 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA(ACRES) = 12.38 SUBAREA RUNOFF(CFS) = 17.83
 EFFECTIVE AREA(ACRES) = 19.23 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 19.2 PEAK FLOW RATE(CFS) = 27.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.05
 FLOW VELOCITY (FEET/SEC.) = 6.60 DEPTH*VELOCITY (FT*FT/SEC.) = 2.69
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21152.00 = 1572.14 FEET.
FLOW PROCESS FROM NODE 21152.00 TO NODE 21153.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014 File name: LR0211ZZ.RES Page 15

Date: 04/21/2014 File name: LR0211ZZ.RES

Page 16

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

RESIDENTIAL

"2 DWELLINGS/ACRE" B 6.40 0.75 0.700 56

RESIDENTIAL

"3-4 DWELLINGS/ACRE" B 1.41 0.75 0.600 56

NATURAL FAIR COVER

"OPEN BRUSH" B 4.11 0.61 1.000 66

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.792

SUBAREA AREA(ACRES) = 31.15 AREA-AVERAGED Fm(INCH/HR) = 0.53

AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.73

TOTAL AREA(ACRES) = 31.1 PEAK FLOW RATE(CFS) = 40.35

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

\*

FLOW PROCESS FROM NODE 21153.00 TO NODE 21126.00 IS CODE = 63

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA

>>>> (STREET TABLE SECTION # 5 USED) <<<<

UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00 STREET LENGTH(FEET) = 807.57 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.33
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.45
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.73
 STREET FLOW TRAVEL TIME (MIN.) = 2.70 Tc (MIN.) = 20.88
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.809
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                         SCS
                                                  Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 7.02 0.75 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.50 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 8.52 SUBAREA RUNOFF (CFS) = 9.96
 EFFECTIVE AREA(ACRES) = 39.67 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 39.7 PEAK FLOW RATE (CFS) =
                                                          45.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.51
 FLOW VELOCITY (FEET/SEC.) = 5.02 DEPTH*VELOCITY (FT*FT/SEC.) = 2.76
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21126.00 = 3110.66 FEET.
******************
 FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 20.88
 RAINFALL INTENSITY (INCH/HR) = 1.81
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.73
 AREA-AVERAGED Ap = 0.72
 EFFECTIVE STREAM AREA(ACRES) = 39.67
 TOTAL STREAM AREA(ACRES) = 39.67
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 45.90
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 17 Date: 04/21/2014 File name: LR0211ZZ.RES Page 18

** CONFLUENCE DATA **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 67.49 22.95 1.709 0.75 (0.51) 0.69 62.7 21121.00  2 45.90 20.88 1.809 0.73 (0.52) 0.72 39.7 21150.00  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO  CONFLUENCE FORMULA USED FOR 2 STREAMS.	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675  SUBAREA AREA(ACRES) = 2.88  SUBAREA RUNOFF(CFS) = 3.29  EFFECTIVE AREA(ACRES) = 99.63  AREA-AVERAGED Fm(INCH/HR) = 0.52  AREA-AVERAGED Fp(INCH/HR) = 0.74  AREA-AVERAGED Ap = 0.70  TOTAL AREA(ACRES) = 105.3  PEAK FLOW RATE(CFS) = 112.67  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
** PEAK FLOW RATE TABLE **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE  1 112.43 20.88 1.809 0.74 (0.52) 0.70 96.7 21150.00  2 109.83 22.95 1.709 0.74 (0.52) 0.70 102.4 21121.00	5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.66    HALFSTREET FLOOD WIDTH(FEET) = 26.19  FLOW VELOCITY(FEET/SEC.) = 7.80    DEPTH*VELOCITY(FT*FT/SEC.) = 5.18  LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21127.00 = 5451.02 FEET.
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  PEAK FLOW RATE (CFS) = 112.43 Tc (MIN.) = 20.88	**************************************
EFFECTIVE AREA(ACRES) = 96.75 AREA-AVERAGED FM(INCH/HR) = 0.52 AREA-AVERAGED FP(INCH/HR) = 0.74 AREA-AVERAGED AP = 0.70 TOTAL AREA(ACRES) = 102.4	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>>
LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.	ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1535.00
**************************************	CHANNEL LENGTH THRU SUBAREA(FEET) = 354.44 CHANNEL SLOPE = 0.0621 CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH(FEET) = 3.00
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	CHANNEL FLOW THRU SUBAREA(CFS) = 112.67 FLOW VELOCITY(FEET/SEC.) = 10.16 FLOW DEPTH(FEET) = 1.29
UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1557.00  STREET LENGTH(FEET) = 322.81 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00	TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 22.15 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21128.00 = 5805.46 FEET.  ** PEAK FLOW RATE TABLE **
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020	STREAM         Q         Tc         Intensity         Fp(Fm)         Ap         Ae         HEADWATER           NUMBER         (CFS)         (MIN.)         (INCH/HR)         (INCH/HR)         (ACRES)         NODE           1         112.67         22.15         1.746         0.74(0.52)         0.70         99.6         21150.00           2         110.07         24.23         1.654         0.74(0.52)         0.70         105.3         21121.00
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	NEW PEAK FLOW DATA ARE:  PEAK FLOW RATE(CFS) = 112.67 Tc(MIN.) = 22.15  AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.74  AREA-AVERAGED Ap = 0.70 EFFECTIVE AREA(ACRES) = 99.63
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70	**************************************
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 114.07  ***STREET FLOWING FULL***	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.67  HALFSTREET FLOOD WIDTH(FEET) = 26.37  AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.79  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.20  STREET FLOW TRAVEL TIME(MIN.) = 0.69 Tc(MIN.) = 21.57  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.774  SUBAREA LOSS RATE DATA(AMC II):	MAINLINE TC(MIN.) = 22.15  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.746  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 10.17 0.75 0.600 56
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	RESIDENTIAL "2 DWELLINGS/ACRE" B 45.95 0.75 0.700 56
RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
"2 DWELLINGS/ACRE" B 2.16 0.75 0.700 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.72 0.75 0.600 56	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682 SUBAREA AREA(ACRES) = 56.12 SUBAREA RUNOFF(CFS) = 62.41 EFFECTIVE AREA(ACRES) = 155.75 AREA-AVERAGED Fm(INCH/HR) = 0.51

Date: 04/21/2014

File name: LR0211ZZ.RES

Page 20

Date: 04/21/2014

File name: LR0211ZZ.RES

Page 19

```
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 161.4 PEAK FLOW RATE (CFS) = 172.56
                                                                        ** MAIN STREAM CONFLUENCE DATA **
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                         1
                                                                                 181.07 23.93 1.666 0.74(0.51) 0.68 173.7 21150.00
                                                                           2 173.69 26.04 1.584 0.74(0.51) 0.68 179.3 21121.00
*************************
                                                                        LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
 FLOW PROCESS FROM NODE 21128.00 TO NODE 21129.00 IS CODE = 54
                                                                        ** MEMORY BANK # 1 CONFLUENCE DATA **
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         STREAM
                                                                                Q Tc Intensity Fp(Fm) Ap Ae
                                                                                (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         NUMBER
_____
                                                                          1
                                                                                 156.61 25.58 1.601 0.75(0.50) 0.67 158.6 21100.00
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1495.00
                                                                        LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1036.57 CHANNEL SLOPE = 0.0386
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
                                                                        ** PEAK FLOW RATE TABLE **
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
                                                                                Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         STREAM
 CHANNEL FLOW THRU SUBAREA(CFS) = 172.56
                                                                         NUMBER
                                                                                (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 FLOW VELOCITY (FEET/SEC.) = 9.68 FLOW DEPTH (FEET) = 1.84
                                                                         1
                                                                                 336.31 23.93 1.666 0.75(0.51) 0.68 322.0 21150.00
 TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 23.93
                                                                                 331.91 25.58 1.601 0.75(0.51) 0.68 336.7 21100.00
                                                                                 327.87 26.04 1.584 0.75(0.51) 0.68 337.9 21121.00
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
                                                                          3
                                                                          TOTAL AREA(ACRES) = 337.9
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                        COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                        PEAK FLOW RATE (CFS) = 336.31 Tc (MIN.) = 23.934
   1 172.56 23.93 1.666 0.74(0.51) 0.69 155.7 21150.00
                                                                        EFFECTIVE AREA(ACRES) = 322.04 AREA-AVERAGED Fm(INCH/HR) = 0.51
    2 165.54 26.04 1.584 0.74(0.51) 0.69 161.4 21121.00
                                                                        AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 NEW PEAK FLOW DATA ARE:
                                                                        TOTAL AREA (ACRES) = 337.9
 PEAK FLOW RATE (CFS) = 172.56 Tc (MIN.) = 23.93
                                                                        LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
 AREA-AVERAGED Fm (INCH/HR) = 0.51 AREA-AVERAGED Fp (INCH/HR) = 0.74
                                                                       AREA-AVERAGED Ap = 0.69 EFFECTIVE AREA(ACRES) = 155.75
                                                                        FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 12
*****************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
                                                                        >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                       ______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 23.93
                                                                        FLOW PROCESS FROM NODE 21129.00 TO NODE 21130.00 IS CODE = 42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.666
 SUBAREA LOSS RATE DATA(AMC II):
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                        >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                       RESIDENTIAL
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1495.00
 "3-4 DWELLINGS/ACRE" B 17.92 0.75 0.600 56
                                                                        DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        FLOW LENGTH (FEET) = 1595.06 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 17.92
                           SUBAREA RUNOFF (CFS) = 19.64
                                                                        USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 EFFECTIVE AREA(ACRES) = 173.67 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                        DEPTH OF FLOW IN 72.0 INCH PIPE IS 37.5 INCHES
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.68
                                                                        PIPE-FLOW VELOCITY(FEET/SEC.) = 22.57
 TOTAL AREA (ACRES) = 179.3 PEAK FLOW RATE (CFS) =
                                                                        PIPE-FLOW(CFS) = 336.31
                                                                        *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        PIPEFLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 25.11
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                        LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21130.00 = 9623.42 FEET.
*****************
                                                                       ******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 11
                                                                        FLOW PROCESS FROM NODE 21130.00 TO NODE 21130.00 IS CODE = 81
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                       _____
```

HEADWATER

Date: 04/21/2014 File name: LR0211ZZ.RES Date: 04/21/2014 File name: LR0211ZZ.RES Page 21 Page 22

```
MAINLINE Tc(MIN.) = 25.11
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.619
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                          Аp
                                                  SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 64.12
                                  0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 64.12
                            SUBAREA RUNOFF (CFS) = 67.53
 EFFECTIVE AREA(ACRES) = 386.16 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 402.0
                            PEAK FLOW RATE(CFS) =
                                                  390.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
FLOW PROCESS FROM NODE 21130.00 TO NODE 21146.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1403.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1317.93 CHANNEL SLOPE = 0.0432
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 390.12
 FLOW VELOCITY (FEET/SEC.) = 12.38 FLOW DEPTH (FEET) = 2.44
 TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 26.89
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm)
                                          Ae
                                                  HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         389.11 26.96 1.551 0.75(0.50) 0.67
                                           386.2 21150.00
    2
         381.96 28.62 1.497 0.75 (0.50) 0.67
                                            400.8 21100.00
         377.36 29.09 1.482 0.75(0.50) 0.67
                                           402.0 21121.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 389.11 Tc (MIN.) = 26.96
 AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.67 EFFECTIVE AREA(ACRES) = 386.16
*****************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 26.96
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.551
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            αA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           22.28
                                    0.75
                                           0.600
                                                 56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      В
                           1.50
                                    0.63
                                          1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625
 SUBAREA AREA(ACRES) = 23.78
                            SUBAREA RUNOFF (CFS) = 23.35
 EFFECTIVE AREA(ACRES) = 409.94 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA(ACRES) = 425.8
                             PEAK FLOW RATE (CFS) =
                                                  390.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.96
 RAINFALL INTENSITY (INCH/HR) = 1.55
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 409.94
 TOTAL STREAM AREA(ACRES) = 425.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 390.01
*******************
 FLOW PROCESS FROM NODE 21140.00 TO NODE 21141.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 286.67
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.750
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.278
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Aρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.17 0.75
                                           0.600
                                                  56
                                                      7.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 5.52
 TOTAL AREA (ACRES) = 2.17 PEAK FLOW RATE (CFS) =
                                              5.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21141.00 TO NODE 21142.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1445.00
 STREET LENGTH (FEET) = 752.60 CURB HEIGHT (INCHES) = 6.0
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 23

File name: LR0211ZZ.RES

Date: 04/21/2014

Page 24

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   18.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.43
   HALFSTREET FLOOD WIDTH (FEET) = 15.15
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 STREET FLOW TRAVEL TIME (MIN.) = 2.70 Tc (MIN.) = 16.89
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.054
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              8.88 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 8.88 SUBAREA RUNOFF (CFS) = 12.83
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 22.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.63
 FLOW VELOCITY (FEET/SEC.) = 3.98 DEPTH*VELOCITY (FT*FT/SEC.) = 1.83
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21143.00 = 1643.57 FEET.
******************
 FLOW PROCESS FROM NODE 21143.00 TO NODE 21144.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1413.00
 STREET LENGTH(FEET) = 592.37 CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    26.98
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.05
 STREET FLOW TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 19.15
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.905
```

File name: LR0211ZZ.RES

Page 26

Date: 04/21/2014

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85

Date: 04/21/2014 File name: LR0211ZZ.RES Page 25

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" B 6.11 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.11 SUBAREA RUNOFF(CFS) = 8.01
 EFFECTIVE AREA(ACRES) = 22.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
                                                        28.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.73
 FLOW VELOCITY (FEET/SEC.) = 4.42 DEPTH*VELOCITY (FT*FT/SEC.) = 2.13
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21144.00 = 2235.94 FEET.
*****
 FLOW PROCESS FROM NODE 21144.00 TO NODE 21145.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1413.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 FLOW LENGTH (FEET) = 90.21 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 10.5 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.40
                  28.84
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.10 Tc (MIN.) = 19.26
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.898
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.65
                                     0.75 0.600 56
                              1.61
                                             0.100 56
 COMMERCIAL
                      В
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.547
 SUBAREA AREA(ACRES) = 15.26 SUBAREA RUNOFF(CFS) = 20.45
 EFFECTIVE AREA(ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 37.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 20.33
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 14.13
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.96
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21145.00 = 2326.15 FEET.
******************
 FLOW PROCESS FROM NODE 21145.00 TO NODE 21146.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1409.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1403.00
 FLOW LENGTH (FEET) = 538.70 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 19.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.81
 PIPE-FLOW(CFS) =
                   49.17
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 20.14
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.848
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
 SUBAREA AREA (ACRES) = 0.00 SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA(ACRES) = 37.3
                                  PEAK FLOW RATE(CFS) = 49.17
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
```

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

File name: LR0211ZZ.RES Page 27 Date: 04/21/2014 File name: LR0211ZZ.RES Page 28

TIME OF CONCENTRATION (MIN.) = 20.14

RAINFALL INTENSITY (INCH/HR) = 1.85

AREA-AVERAGED Fm(INCH/HR) = 0.43

AREA-AVERAGED Fp(INCH/HR) = 0.75

AREA-AVERAGED Ap = 0.58

EFFECTIVE STREAM AREA(ACRES) = 37.27

TOTAL STREAM AREA(ACRES) = 37.27

PEAK FLOW RATE (CFS) AT CONFLUENCE =

#### \*\* CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	390.01	26.96	1.551	0.75(0.49)	0.66	409.9	21150.00
1	382.90	28.62	1.497	0.75(0.49)	0.66	424.6	21100.00
1	378.42	29.09	1.482	0.75(0.49)	0.66	425.8	21121.00
2	49.17	20.14	1.848	0.75 ( 0.43)	0.58	37.3	21140.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

#### \*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Аe	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	422.29	20.14	1.848	0.75(0.49)	0.65	343.5	21140.00
2	428.87	26.96	1.551	0.75( 0.49)	0.66	447.2	21150.00
3	419.87	28.62	1.497	0.75(0.49)	0.66	461.8	21100.00
4	414.89	29.09	1.482	0.75 ( 0.49)	0.66	463.1	21121.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 428.87 Tc (MIN.) = 26.96

EFFECTIVE AREA(ACRES) = 447.21 AREA-AVERAGED Fm(INCH/HR) = 0.49

AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66

TOTAL AREA (ACRES) = 463.1

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET.

\* .\_\_\_\_\_

FLOW PROCESS FROM NODE 21146.00 TO NODE 21165.00 IS CODE = 54

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<

\_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1403.00 DOWNSTREAM(FEET) = 1393.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 424.11 CHANNEL SLOPE = 0.0236

CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000

MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00

Date: 04/21/2014 File name: LR0211ZZ.RES

CHANNEL FLOW THRU SUBAREA(CFS) = 428.87

FLOW VELOCITY (FEET/SEC.) = 10.21 FLOW DEPTH (FEET) = 3.00

TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 27.65

Page 29

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.

## \*\* PEAK FLOW RATE TABLE \*\*

STF	REAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUM	1BER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
	1	422.29	20.84	1.811	0.75(0.49)	0.65	343.5	21140.00
	2	428.87	27.65	1.528	0.75(0.49)	0.66	447.2	21150.00
	3	419.87	29.31	1.476	0.75(0.49)	0.66	461.8	21100.00
	4	414.89	29.78	1.461	0.75(0.49)	0.66	463.1	21121.00
ATTITUTE.	DENK	DION DAMA	ADD.					

NEW PEAK FLOW DATA ARE:

PEAK FLOW RATE (CFS) = 428.87 Tc (MIN.) = 27.65

AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.75

AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) =

\* FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 10

>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<

\_\_\_\_\_ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 21154.00 TO NODE 21154.20 IS CODE = 21 \_\_\_\_\_\_

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

\_\_\_\_\_\_

INITIAL SUBAREA FLOW-LENGTH (FEET) = 709.46

ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.117

\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.793

SUBAREA TC AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
NATURAL FAIR COVER						
"OPEN BRUSH"	В	8.73	0.61	1.000	66	17.34
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	В	0.90	0.75	0.600	56	10.12
RESIDENTIAL						
"2 DWELLINGS/ACRE"	В	0.18	0.75	0.700	56	10.76
SUBAREA AVERAGE PERVIOUS	S LOSS RAT	TE, Fp(IN	CH/HR) = 0	.62		
SUBAREA AVERAGE PERVIOUS	S AREA FRA	ACTION. A	0.958			

SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.908

SUBAREA RUNOFF(CFS) = 19.39

TOTAL AREA(ACRES) = 9.81 PEAK FLOW RATE(CFS) = 19.39

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 21154.20 TO NODE 21154.40 IS CODE = 54

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<

\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1620.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 614.72 CHANNEL SLOPE = 0.0976

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                           "OPEN BRUSH"
                                                                                                B 17.09
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                           RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.65 FLOW DEPTH (FEET) = 0.83
                                                                           "2 DWELLINGS/ACRE"
                                                                                                       4.24
 TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 11.93
                                                                           RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21154.40 = 1324.18 FEET.
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                                В
                                                                                                     0.47
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
*****************
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933
 FLOW PROCESS FROM NODE 21154.40 TO NODE 21154.40 IS CODE = 81
                                                                           SUBAREA AREA (ACRES) = 21.80
                                                                                                       SUBAREA RUNOFF (CFS) = 32.31
______
                                                                           EFFECTIVE AREA(ACRES) = 50.89 AREA-AVERAGED Fm(INCH/HR) = 0.59
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94
______
                                                                           TOTAL AREA(ACRES) = 50.9
                                                                                                        PEAK FLOW RATE(CFS) =
 MAINLINE Tc (MIN.) = 11.93
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.530
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fр
                                                                         *******************
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           FLOW PROCESS FROM NODE 21155.00 TO NODE 21156.00 IS CODE = 54
 NATURAL FAIR COVER
                      В
                         15.02
                                            1.000
 "OPEN BRUSH"
                                     0.61
                                                   66
 RESIDENTIAL
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                    в 4.09
 "2 DWELLINGS/ACRE"
                                     0.75
                                            0.700
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                    56
 RESIDENTIAL
                                                                         ______
 "3-4 DWELLINGS/ACRE" B
                             0.17
                                     0.75
                                            0.600
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1545.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 1194.85 CHANNEL SLOPE = 0.0293
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933
                                                                           CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 SUBAREA AREA(ACRES) = 19.28
                             SUBAREA RUNOFF (CFS) = 33.61
                                                                           MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 EFFECTIVE AREA(ACRES) = 29.09 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                           CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                        75.37
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94
                                                                           FLOW VELOCITY (FEET/SEC.) = 5.05 FLOW DEPTH (FEET) = 1.73
 TOTAL AREA (ACRES) = 29.1 PEAK FLOW RATE (CFS) =
                                                    50.67
                                                                           TRAVEL TIME (MIN.) = 3.94 Tc (MIN.) = 18.56
                                                                           LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21156.00 = 3393.06 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         ******************
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                           FLOW PROCESS FROM NODE 21156.00 TO NODE 21156.00 IS CODE = 81
********************
                                                                         ______
 FLOW PROCESS FROM NODE 21154.40 TO NODE 21155.00 IS CODE = 54
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                           MAINLINE Tc(MIN.) = 18.56
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                           * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.941
_____
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
                                                                           DEVELOPMENT TYPE/
                                                                                              SCS SOIL AREA
 CHANNEL LENGTH THRU SUBAREA (FEET) = 874.03 CHANNEL SLOPE = 0.0458
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
                                                                           RESIDENTIAL
                                                                                                     4.30
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                                В
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              50.67
                                                                           RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.41 FLOW DEPTH (FEET) = 1.37
                                                                           "2 DWELLINGS/ACRE"
                                                                                                     39.32
 TRAVEL TIME (MIN.) = 2.69 Tc (MIN.) = 14.62
                                                                           NATURAL FAIR COVER
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21155.00 = 2198.21 FEET.
                                                                                                       7.87
                                                                           "OPEN BRUSH"
                                                                                                R
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
******************
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738
 FLOW PROCESS FROM NODE 21155.00 TO NODE 21155.00 IS CODE = 81
                                                                           SUBAREA AREA(ACRES) = 51.49
                                                                                                      SUBAREA RUNOFF (CFS) = 65.32
                                                                           EFFECTIVE AREA(ACRES) = 102.38 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                           TOTAL AREA (ACRES) =
                                                                                            102.4
                                                                                                        PEAK FLOW RATE (CFS) = 127.01
 MAINLINE Tc (MIN.) = 14.62
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.239
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
```

Page 31

Date: 04/21/2014

File name: LR021177.RFS

FLOW PROCESS FROM NODE 21156.00 TO NODE 21157.00 IS CODE = 63 Date: 04/21/2014 File name: LR021177.RFS Page 32

Fρ

0.75

0.75

0.61 1.000

Aρ

0.600

0.700

56

0.61 1.000

0.75 0.600

0.700

0.75

66

56

75.37

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1545.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
 STREET LENGTH (FEET) = 796.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      LAND USE
                                                                                  RESIDENTIAL
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.29
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.21
 STREET FLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 19.99
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.856
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 10.24
                                         0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.14
                                         0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633
 SUBAREA AREA(ACRES) = 15.38
                             SUBAREA RUNOFF (CFS) = 19.14
 EFFECTIVE AREA(ACRES) = 117.76 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 117.8 PEAK FLOW RATE (CFS) = 138.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.56
 FLOW VELOCITY (FEET/SEC.) = 9.32 DEPTH*VELOCITY (FT*FT/SEC.) = 6.26
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21157.00 = 4189.56 FEET.
******************
 FLOW PROCESS FROM NODE 21157.00 TO NODE 21163.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1500.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1452.00
 FLOW LENGTH (FEET) = 1406.44 MANNING'S N = 0.013
```

```
USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 24.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 21.34
 PIPE-FLOW(CFS) = 138.35
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 21.16
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.794
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                                                  Aр
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE" B 19.67 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 19.67 SUBAREA RUNOFF (CFS) = 23.81
 EFFECTIVE AREA(ACRES) = 137.43 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) = 155.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 17.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 13.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.69
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
*******************
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.16
 RAINFALL INTENSITY (INCH/HR) = 1.79
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.78
 EFFECTIVE STREAM AREA(ACRES) = 137.43
 TOTAL STREAM AREA(ACRES) = 137.43
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 155.58
```

Page 34

Date: 04/21/2014 File name: LR0211ZZ.RES Page 33 Date: 04/21/2014 File name: LR0211ZZ.RES

```
******************
 FLOW PROCESS FROM NODE 21160.00 TO NODE 21161.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 381.26
 ELEVATION DATA: UPSTREAM(FEET) = 1545.00 DOWNSTREAM(FEET) = 1522.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.785
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.269
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Ар
                                                SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          5.01 0.75 0.600 56 7.79
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 12.72
 TOTAL AREA (ACRES) =
                   5.01 PEAK FLOW RATE (CFS) = 12.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21161.00 TO NODE 21162.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1522.00 DOWNSTREAM(FEET) = 1500.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 409.32 CHANNEL SLOPE = 0.0537
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           12.72
 FLOW VELOCITY (FEET/SEC.) = 5.27 FLOW DEPTH (FEET) = 0.49
 TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 9.08
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21162.00 = 790.58 FEET.
*****************
 FLOW PROCESS FROM NODE 21162.00 TO NODE 21162.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 9.08
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.981
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                          Aр
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.71 0.75
                                         0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 4.71 SUBAREA RUNOFF (CFS) = 10.73
 EFFECTIVE AREA(ACRES) = 9.72 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 9.7 PEAK FLOW RATE(CFS) =
                                               22.15
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21162.00 TO NODE 21163.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1452.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1513.07 CHANNEL SLOPE = 0.0317
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             22.15
 FLOW VELOCITY (FEET/SEC.) = 5.21 FLOW DEPTH (FEET) = 0.77
 TRAVEL TIME (MIN.) = 4.84 Tc (MIN.) = 13.92
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21163.00 = 2303.65 FEET.
******************
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 13.92
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.307
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Дp
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 14.70 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 14.70 SUBAREA RUNOFF(CFS) = 24.58
 EFFECTIVE AREA(ACRES) = 24.42 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 24.4
                             PEAK FLOW RATE (CFS) =
                                                   40.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.92
 RAINFALL INTENSITY (INCH/HR) = 2.31
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 24.42
 TOTAL STREAM AREA(ACRES) = 24.42
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                40.83
```

File name: LR021177.RFS

Page 36

Date: 04/21/2014

```
** CONFLUENCE DATA **
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.74
                Tc Intensity Fp(Fm)
                                                    HEADWATER
                                                                            TOTAL AREA (ACRES) =
                                                                                              176.9
                                                                                                                             198.71
  STREAM
           0
                                        Ap Ae
                                                                                                          PEAK FLOW RATE(CFS) =
                                             (ACRES) NODE
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
    1
          155.58 21.16 1.794 0.69(0.54)0.78 137.4 21154.00
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
    2
          40.83 13.92 2.307 0.75(0.45) 0.60
                                             24.4 21160.00
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                            ** PEAK FLOW RATE TABLE **
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                             STREAM
                                                                                      O Tc Intensity Fp(Fm)
                                                                                                                   Ap Ae
                                                                                                                               HEADWATER
                                                                             NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                        (ACRES) NODE
 ** PEAK FLOW RATE TABLE **
                                                                                     203.15 14.51 2.250 0.70(0.51)0.73 129.9 21160.00
                                                                             1
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                  198.43 21.75 1.765 0.70(0.52) 0.74 176.9 21154.00
  STREAM
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            NEW PEAK FLOW DATA ARE:
   1
          184.87 13.92 2.307 0.70(0.52) 0.74 114.8 21160.00
                                                                            PEAK FLOW RATE (CFS) = 203.15 Tc (MIN.) = 14.51
          185.14 21.16 1.794 0.69(0.52) 0.75 161.8 21154.00
                                                                            AREA-AVERAGED Fm (INCH/HR) = 0.51 AREA-AVERAGED Fp (INCH/HR) = 0.70
    2
                                                                            AREA-AVERAGED Ap = 0.73 EFFECTIVE AREA(ACRES) =
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                          ******************
 PEAK FLOW RATE (CFS) = 185.14 Tc (MIN.) = 21.16
 EFFECTIVE AREA(ACRES) = 161.85 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                            FLOW PROCESS FROM NODE 21164.00 TO NODE 21165.00 IS CODE = 42
 AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.75
 TOTAL AREA(ACRES) = 161.8
                                                                            >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
                                                                            >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                          ******************
                                                                            UPSTREAM NODE ELEVATION (FEET) = 1436.00
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21164.00 IS CODE = 42
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 1393.00
                                                                            FLOW LENGTH (FEET) = 1236.24 MANNING'S N = 0.013
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                            USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
_____
                                                                            DEPTH OF FLOW IN 54.0 INCH PIPE IS 28.7 INCHES
 UPSTREAM NODE ELEVATION (FEET) = 1452.00
                                                                            PIPE-FLOW VELOCITY(FEET/SEC.) = 23.65
 DOWNSTREAM NODE ELEVATION (FEET) = 1436.00
                                                                            PIPE-FLOW(CFS) = 203.15
 FLOW LENGTH (FEET) = 667.61 MANNING'S N = 0.013
                                                                            *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                            PIPEFLOW TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 15.38
                                                                            LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21165.00 = 7499.85 FEET.
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 30.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 20.07
                                                                          *************************
 PIPE-FLOW(CFS) = 185.14
                                                                            FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 81
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.55 Tc (MIN.) = 21.72
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21164.00 = 6263.61 FEET.
                                                                          MAINLINE Tc(MIN.) = 15.38
*****************
                                                                            * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.173
 FLOW PROCESS FROM NODE 21164.00 TO NODE 21164.00 IS CODE = 81
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                Fρ
                                                                                                                               SCS
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                               LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                       1.72
______
                                                                            SCHOOL
                                                                                                 В
                                                                                                                 0.75
                                                                                                                        0.600
 MAINLINE Tc(MIN.) = 21.72
                                                                            RESIDENTIAL
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.766
                                                                            "3-4 DWELLINGS/ACRE" B 10.42 0.75
                                                                                                                        0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                              Αp
                                                    SCS
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            SUBAREA AREA(ACRES) = 12.14 SUBAREA RUNOFF(CFS) = 18.83
 RESIDENTIAL
                                                                            EFFECTIVE AREA(ACRES) = 142.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
 "3-4 DWELLINGS/ACRE" B
                            13.33
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.72
                                      0.75
                                             0.600
 AGRICULTURAL FAIR COVER
                                                                            TOTAL AREA (ACRES) = 189.1 PEAK FLOW RATE (CFS) =
                                                                                                                               212.94
                             1.74
 "ORCHARDS"
                                     0.63
                                            1.000 65
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
                                                                            5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 SUBAREA AREA (ACRES) = 15.07 SUBAREA RUNOFF (CFS) = 17.59
                                                                          EFFECTIVE AREA(ACRES) = 176.92 AREA-AVERAGED Fm(INCH/HR) = 0.52
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 37

File name: LR0211ZZ.RES

Date: 04/21/2014

Page 38

Them therefore them here 21100.00 to here 21100.00 to dobb 11

>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY

>>>>CONTIDUENCE PREPIONI DANK # 2 WITH THE PAIN STREAM PREPIONI

### \*\* MAIN STREAM CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Аe	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	212.34	15.44	2.168	0.70(0.51)	0.72	142.0	21160.00
2	205.34	22.68	1.721	0.70(0.51)	0.73	189.1	21154.00
LONGEST	FI.OWPATH	FROM NODE	21154 00	TO NODE 2	1165 00	= 749	99 85 FEET

#### \*\* MEMORY BANK # 2 CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	422.29	20.84	1.811	0.75( 0.49)	0.65	343.5	21140.00
2	428.87	27.65	1.528	0.75(0.49)	0.66	447.2	21150.00
3	419.87	29.31	1.476	0.75(0.49)	0.66	461.8	21100.00
4	414.89	29.78	1.461	0.75( 0.49)	0.66	463.1	21121.00
LONGEST	FLOWPATH F	ROM NODE	E 21100.00	TO NODE 2	1165.00	) = 1136	55.46 FEET.

#### \*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	609.62	15.44	2.168	0.73( 0.49)	0.68	396.5	21160.00
2	629.42	20.84	1.811	0.73( 0.50)	0.68	520.6	21140.00
3	629.42	22.68	1.721	0.73( 0.50)	0.68	560.7	21154.00
4	601.41	27.65	1.528	0.73( 0.50)	0.68	636.3	21150.00
5	583.48	29.31	1.476	0.73( 0.50)	0.68	650.9	21100.00
6	576.09	29.78	1.461	0.73( 0.50)	0.68	652.1	21121.00
TOTAL	AREA (ACRES)	=	652.1				

### COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 629.42 Tc (MIN.) = 20.836

EFFECTIVE AREA(ACRES) = 520.58 AREA-AVERAGED Fm(INCH/HR) = 0.50

AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.68

TOTAL AREA (ACRES) = 652.1

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.

FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 71

# UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.98;3H= 1.60;6H= 2.17;24H= 4.36 S-GRAPH: VALLEY(DEV.)= 91.4%;VALLEY(UNDEV.)/DESERT= 8.6%

\_\_\_\_\_\_

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.49; LAG(HR) = 0.39; Fm(INCH/HR) = 0.50; Ybar = 0.57

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;

3HR = 1.00; 6HR = 1.00; 24HR = 1.00

Date: 04/21/2014

UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 652.1

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0401; Lca/L=0.4,n=.0359; Lca/L=0.5,n=.0330; Lca/L=0.6,n=.0308 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 118.12

```
File name: LR0211ZZ.RES Page 39
```

```
UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 667.06
 TOTAL PEAK FLOW RATE (CFS) = 667.06 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 629.42
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 629.42)
 PEAK FLOW RATE (CFS) USED = 667.06
******************
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
******************
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21166.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1393.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1357.00
 FLOW LENGTH (FEET) = 1083.24 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 85.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 85.0 INCH PIPE IS 45.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 31.29
 PIPE-FLOW(CFS) = 667.06
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 29.89
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
******************
 FLOW PROCESS FROM NODE 21166.00 TO NODE 21166.00 IS CODE = 81
.....
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 29.89
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.458
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                  Fρ
                                           αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                   В
                           28.30 0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
                            18.42
 SCHOOL
                      В
                                     0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 46.72
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.98;3H= 1.59;6H= 2.17;24H= 4.35
 S-GRAPH: VALLEY (DEV.) = 92.0%; VALLEY (UNDEV.) / DESERT= 8.0%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.50; LAG(HR) = 0.40; Fm(INCH/HR) = 0.49; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 698.8
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0380; Lca/L=0.4, n=.0341; Lca/L=0.5, n=.0313; Lca/L=0.6, n=.0292
```

```
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 129.80
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 703.13
 TOTAL AREA(ACRES) = 698.8
                             PEAK FLOW RATE (CFS) = 703.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21166.00 TO NODE 21167.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1357.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1320.00
 FLOW LENGTH (FEET) = 1316.79 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 84.0 INCH PIPE IS 49.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 29.69
 PIPE-FLOW(CFS) = 703.13
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 30.63
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
*******************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 30.63
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.437
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                      SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В 42.55
                                      0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 42.55
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.98;3H= 1.59;6H= 2.16;24H= 4.35
 S-GRAPH: VALLEY (DEV.) = 92.4%; VALLEY (UNDEV.) / DESERT= 7.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.51; LAG(HR) = 0.41; Fm(INCH/HR) = 0.49; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 741.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0359; Lca/L=0.4,n=.0322; Lca/L=0.5,n=.0295; Lca/L=0.6,n=.0276
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 127.73
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 711.09
 TOTAL AREA (ACRES) = 741.4 PEAK FLOW RATE (CFS) =
                                                    711.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
```

File name: LR0211ZZ.RES

Page 41

Date: 04/21/2014

```
FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 152

>>>>>STORE PEAK FLOWRATE TABLE TO A FILE<

PEAK FLOWRATE TABLE FILE NAME: 21167.DNA

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 741.4 TC (MIN.) = 30.63

AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.57

PEAK FLOW RATE (CFS) = 711.09
```

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2012 Advanced Engineering Software (aes) Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21248

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0212ZZ.DAT

Date: 04/21/2014

TIME/DATE OF STUDY: 08:04 11/19/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

File name: LR0212ZZ.RES

Page 1

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21200.00 TO NODE 21201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 569.96 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1707.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.219 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.954 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS Tc αp GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE SCHOOL 0.54 0.75 0.600 56 9.22 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 56 9.22 RESIDENTIAL 4.38 0.75 0.700 9.80 "2 DWELLINGS/ACRE" В 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673 SUBAREA RUNOFF (CFS) = 13.28TOTAL AREA (ACRES) = 6.02 PEAK FLOW RATE (CFS) = 13.28 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21201.00 TO NODE 21202.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<<

File name: LR0212ZZ.RES

Page 2

\_\_\_\_\_\_ UPSTREAM ELEVATION (FEET) = 1707.00 DOWNSTREAM ELEVATION (FEET) = 1695.00

STREET LENGTH (FEET) = 243.63 CURB HEIGHT (INCHES) = 8.0

Date: 04/21/2014

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     27.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 15.89
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.06
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.41
 STREET FLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 11.66
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.565
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.92 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.90 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA(ACRES) = 9.82 SUBAREA RUNOFF(CFS) = 18.11
 EFFECTIVE AREA(ACRES) = 18.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 18.7 PEAK FLOW RATE (CFS) = 34.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 17.47
 FLOW VELOCITY (FEET/SEC.) = 5.34 DEPTH*VELOCITY (FT*FT/SEC.) = 2.71
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21203.00 = 1295.94 FEET.
******************
 FLOW PROCESS FROM NODE 21203.00 TO NODE 21204.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1675.00 DOWNSTREAM ELEVATION(FEET) = 1638.00
 STREET LENGTH (FEET) = 756.35 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74
                                                     42.49
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
       Date: 04/21/2014 File name: LR0212ZZ.RES
                                                         Page 4
```

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0212ZZ.RES Page 3

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
HALFSTREET FLOOD WIDTH (FEET) = 18.35
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.97
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.14
 STREET FLOW TRAVEL TIME (MIN.) = 2.11 Tc(MIN.) = 13.77
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.322
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                               ąκ
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                      B 7.90
                                         0.75
                                                 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.70 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 9.60
                             SUBAREA RUNOFF(CFS) = 15.65
 EFFECTIVE AREA(ACRES) = 28.29 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 28.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 18.94
 FLOW VELOCITY (FEET/SEC.) = 6.12 DEPTH*VELOCITY (FT*FT/SEC.) = 3.29
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21204.00 = 2052.29 FEET.
******************
 FLOW PROCESS FROM NODE 21204.00 TO NODE 21205.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1638.00 DOWNSTREAM ELEVATION(FEET) = 1633.00
 STREET LENGTH (FEET) = 323.24 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.99
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.66
  HALFSTREET FLOOD WIDTH (FEET) = 24.97
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.07
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.68
 STREET FLOW TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 15.09
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.197
 SUBAREA LOSS RATE DATA (AMC II):
                                              Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

```
RESIDENTIAL.
 "3-4 DWELLINGS/ACRE"
                        B 6.52
                                        0.75
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 1.27 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 7.79 SUBAREA RUNOFF (CFS) = 12.26
 EFFECTIVE AREA(ACRES) = 36.08 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 36.1 PEAK FLOW RATE (CFS) =
                                                        55.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.67 HALFSTREET FLOOD WIDTH (FEET) = 25.58
 FLOW VELOCITY (FEET/SEC.) = 4.13 DEPTH*VELOCITY (FT*FT/SEC.) = 2.76
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21205.00 = 2375.53 FEET.
FLOW PROCESS FROM NODE 21205.00 TO NODE 21206.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1633.00 DOWNSTREAM ELEVATION(FEET) = 1629.00
 STREET LENGTH (FEET) = 199.37 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.92
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  59.25
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 24.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.63
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.04
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 15.81
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.137
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.19
                                        0.75
                                                0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                             4.19 0.75 0.700
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
 SUBAREA AREA (ACRES) = 5.38 SUBAREA RUNOFF (CFS) = 7.89
 EFFECTIVE AREA(ACRES) = 41.46 AREA-AVERAGED Fm(INCH/HR) = 0.50
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 6

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) =
                    41.5 PEAK FLOW RATE (CFS) =
                                                          61.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.21
 FLOW VELOCITY (FEET/SEC.) = 4.68 DEPTH*VELOCITY (FT*FT/SEC.) = 3.10
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21206.00 = 2574.90 FEET.
******************
 FLOW PROCESS FROM NODE 21206.00 TO NODE 21207.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1629.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 607.72 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.56
 STREET FLOW TRAVEL TIME (MIN.) = 1.80 Tc (MIN.) = 17.61
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.003
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Аp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.03
                                         0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.49
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                               SUBAREA RUNOFF(CFS) = 8.78
 SUBAREA AREA(ACRES) = 6.52
 EFFECTIVE AREA(ACRES) = 47.98 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 48.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.69
```

```
LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21207.00 = 3182.62 FEET.
FLOW PROCESS FROM NODE 21207.00 TO NODE 21208.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 532.97 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 70.06
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.85
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 19.06
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.910
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 6.92 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 1.09 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 8.01 SUBAREA RUNOFF (CFS) = 10.07
 EFFECTIVE AREA(ACRES) = 55.99 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 56.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.69
 FLOW VELOCITY (FEET/SEC.) = 6.13 DEPTH*VELOCITY (FT*FT/SEC.) = 3.87
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21208.00 = 3715.59 FEET.
*****************
 FLOW PROCESS FROM NODE 21208.00 TO NODE 21209.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
```

FLOW VELOCITY (FEET/SEC.) = 5.61 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.54

Date: 04/21/2014 File name: LR021277.RFS

Page 8

```
_____
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1550.00
 STREET LENGTH (FEET) = 677.51 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 21.93
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.35
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.38
 STREET FLOW TRAVEL TIME (MIN.) = 1.54 Tc (MIN.) = 20.60
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.823
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               0.99
                                        0.75
                                                0.600
                                                       56
 RESIDENTIAL
                              2.98
 "2 DWELLINGS/ACRE"
                      В
                                        0.75
                                                0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA (ACRES) = 3.97 SUBAREA RUNOFF (CFS) = 4.71
 EFFECTIVE AREA(ACRES) = 59.96 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 60.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.69
 FLOW VELOCITY (FEET/SEC.) = 7.29 DEPTH*VELOCITY (FT*FT/SEC.) = 4.32
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21209.00 = 4393.10 FEET.
********************
 FLOW PROCESS FROM NODE 21209.00 TO NODE 21215.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1520.00
 FLOW LENGTH (FEET) = 978.51 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 2.00
 FLOWDEPTH IN BOX IS 1.17 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 15.23
                  71.42
 BOX-FLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 21.67
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
```

```
*************************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 21.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.769
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          5.58
                                 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.58 SUBAREA RUNOFF (CFS) = 6.63
 EFFECTIVE AREA(ACRES) = 65.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 65.5 PEAK FLOW RATE (CFS) = 75.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
______
FLOW PROCESS FROM NODE 21213.30 TO NODE 21213.40 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 760.53
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.918
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.307
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 SCS Tc
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                          8.73
                                                  56 13.92
 SCHOOL
                     В
                                    0.75
                                           0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 1.08
                                    0.75
                                           0.600
                                                  56 13.92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 16.40
 TOTAL AREA(ACRES) = 9.81 PEAK FLOW RATE(CFS) = 16.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21213.40 TO NODE 21213.50 IS CODE = 63
```

File name: LR0212ZZ.RES

Page 10

Date: 04/21/2014

```
>>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION (FEET) = 1690.00 DOWNSTREAM ELEVATION (FEET) = 1640.00
 STREET LENGTH (FEET) = 1952.61 CURB HEIGHT (INCHES) = 6.0
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                 42.18
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 STREET FLOW DEPTH (FEET) = 0.50
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 18.00
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.95
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.95
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  28.17
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 5.99 Tc (MIN.) = 27.64
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.529
   STREET FLOW DEPTH(FEET) = 0.49
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 17.96
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fρ
                                                                                                                                     SCS
                                                                                                                              Αp
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.21
                                                                                    LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.04
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                    B 14.39 0.75 0.700
 STREET FLOW TRAVEL TIME (MIN.) = 7.73 Tc (MIN.) = 21.64
                                                                                                                                      56
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.770
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 1.85 0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                                    56
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fρ
                                                Αp
                                                      SCS
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689
                             3.65 0.75 0.600 56
                                                                                SUBAREA AREA (ACRES) = 16.24 SUBAREA RUNOFF (CFS) = 14.81
 SCHOOL
                      В
                                                                                EFFECTIVE AREA(ACRES) = 46.16 AREA-AVERAGED Fm(INCH/HR) = 0.49
 RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" B 4.28 0.75 0.600
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
                                                     56
 RESIDENTIAL
                                                                                TOTAL AREA (ACRES) = 46.2 PEAK FLOW RATE (CFS) =
                                                                                                                                       43.07
 "2 DWELLINGS/ACRE" B 12.18
                                       0.75
                                             0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.661
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 SUBAREA AREA (ACRES) = 20.11 SUBAREA RUNOFF (CFS) = 23.09
 EFFECTIVE AREA (ACRES) = 29.92 AREA-AVERAGED Fm (INCH/HR) = 0.48
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
                                                                                DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.00 DEPTH*VELOCITY (FT*FT/SEC.) = 2.99
 TOTAL AREA (ACRES) = 29.9
                               PEAK FLOW RATE (CFS) =
                                                                                LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                              ****************
                                                                                FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 10
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.50
                                                                                >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 FLOW VELOCITY (FEET/SEC.) = 4.59 DEPTH*VELOCITY (FT*FT/SEC.) = 2.34
                                                                              ______
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21213.50 = 2713.14 FEET.
                                                                              ****************
FLOW PROCESS FROM NODE 21210.00 TO NODE 21211.00 IS CODE = 21
 FLOW PROCESS FROM NODE 21213.50 TO NODE 21214.00 IS CODE = 63
                                                                                >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              ______
_____
                                                                                INITIAL SUBAREA FLOW-LENGTH (FEET) = 788.20
 UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1540.00
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 STREET LENGTH (FEET) = 2138.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.838

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 File name: LR0212ZZ.RES Page 11 Date: 04/21/2014 File name: LR0212ZZ.RES Page 12

```
* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.542
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                             αA
                                                   SCS Tc
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    в 4.70
                                   0.75 0.700
                                                  56 12.59
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.64 0.75 0.600 56 11.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA RUNOFF (CFS) = 9.74
 TOTAL AREA (ACRES) = 5.34 PEAK FLOW RATE (CFS) = 9.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21211.00 TO NODE 21212.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1610.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 337.81 CHANNEL SLOPE = 0.0444
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.53 FLOW DEPTH (FEET) = 0.74
 TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 13.43
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21212.00 = 1126.01 FEET.
*****
 FLOW PROCESS FROM NODE 21212.00 TO NODE 21212.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 13.43
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.356
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           αA
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                    B 7.68 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 7.68
                            SUBAREA RUNOFF(CFS) = 12.67
 EFFECTIVE AREA(ACRES) = 13.02 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 13.0 PEAK FLOW RATE (CFS) =
                                                   21.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21212.00 TO NODE 21213.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1592.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 463.88 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             21.52
 FLOW VELOCITY (FEET/SEC.) = 3.46 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 2.23 Tc (MIN.) = 15.67
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21213.00 = 1589.89 FEET.
******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
______
 MAINLINE Tc (MIN.) = 15.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.149
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 5.46
                                    0.75 0.700
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.60 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA(ACRES) = 6.06
                           SUBAREA RUNOFF (CFS) = 8.90
 EFFECTIVE AREA(ACRES) = 19.08 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 19.1 PEAK FLOW RATE(CFS) =
                                                   27.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
************************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.67
 RAINFALL INTENSITY (INCH/HR) = 2.15
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 19.08
 TOTAL STREAM AREA(ACRES) = 19.08
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                27.99
******************
 FLOW PROCESS FROM NODE 21213.10 TO NODE 21213.20 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 686.22
 ELEVATION DATA: UPSTREAM(FEET) = 1642.00 DOWNSTREAM(FEET) = 1610.00
```

\_\_\_\_\_

Date: 04/21/2014 File name: LR0212ZZ.RES Page 13 Date: 04/21/2014 File name: LR0212ZZ.RES

Page 14

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.369
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.752
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                            Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 PUBLIC PARK
                    В 1.60
                                      0.75
                                              0.850 56 12.16
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 1.75 0.75
                                              0.700
                                                    56 11.02
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.25 0.75
                                              0.600
                                                    56 10.37
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760
 SUBAREA RUNOFF(CFS) = 7.08
 TOTAL AREA (ACRES) = 3.60 PEAK FLOW RATE (CFS) = 7.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
FLOW PROCESS FROM NODE 21213.20 TO NODE 21213.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1592.00
 STREET LENGTH (FEET) = 944.44 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.33
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.13
 STREET FLOW TRAVEL TIME (MIN.) = 5.30 Tc (MIN.) = 15.67
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.149
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                            αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                    в 0.14 0.75
                                              0.850 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 4.29 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
 SUBAREA AREA (ACRES) = 4.43 SUBAREA RUNOFF (CFS) = 6.47
 EFFECTIVE AREA(ACRES) = 8.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 8.0 PEAK FLOW RATE (CFS) = 11.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.35
 FLOW VELOCITY (FEET/SEC.) = 3.05 DEPTH*VELOCITY (FT*FT/SEC.) = 1.20
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.67
 RAINFALL INTENSITY (INCH/HR) = 2.15
 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.73
 EFFECTIVE STREAM AREA(ACRES) = 8.03
 TOTAL STREAM AREA(ACRES) = 8.03
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 11.59
 ** CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
          27.99 15.67 2.149 0.75 (0.52) 0.69 19.1 21210.00
          11.59 15.67 2.149 0.75(0.55) 0.73 8.0 21213.10
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          39.57 15.67 2.149 0.75 (0.53) 0.70 27.1 21213.10
          39.57 15.67 2.149 0.75(0.53) 0.70 27.1 21210.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 39.57 Tc (MIN.) = 15.67
 EFFECTIVE AREA(ACRES) = 27.11 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 27.1
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21214.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1592.00 DOWNSTREAM(FEET) = 1540.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 580.67 CHANNEL SLOPE = 0.0896
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 16

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
                                                                         LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         ** PEAK FLOW RATE TABLE **
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             39.57
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 FLOW VELOCITY (FEET/SEC.) = 5.56 FLOW DEPTH (FEET) = 0.84
 TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 17.41
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
                                                                          1
                                                                                  82.55 17.41 2.017 0.75(0.51) 0.68 60.8 21213.10
                                                                                  82.55 17.41 2.017 0.75(0.51) 0.68 60.8 21210.00
                                                                                  71.75 27.64 1.529 0.75(0.51) 0.68 77.9 21213.30
 ** PEAK FLOW RATE TABLE **
                                                                            3
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                          TOTAL AREA (ACRES) =
                                                                                              77.9
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          39.57 17.41 2.017 0.75 (0.53) 0.70 27.1 21213.10
                                                                         COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   1
    2
          39.57 17.41 2.017 0.75 (0.53) 0.70 27.1 21210.00
                                                                         PEAK FLOW RATE (CFS) = 82.55 Tc (MIN.) = 17.410
 NEW PEAK FLOW DATA ARE:
                                                                         EFFECTIVE AREA(ACRES) = 60.83 AREA-AVERAGED Fm(INCH/HR) = 0.51
 PEAK FLOW RATE (CFS) = 39.57 Tc (MIN.) = 17.41
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 AREA-AVERAGED Fm (INCH/HR) = 0.53 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                         TOTAL AREA (ACRES) =
                                                                                          77.9
 AREA-AVERAGED Ap = 0.70 EFFECTIVE AREA(ACRES) = 27.11
                                                                         LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
*****************
                                                                        FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 81
                                                                         FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 12
______
                                                                        ______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                         >>>>CLEAR MEMORY BANK # 1 <<<<
______
 MAINLINE Tc (MIN.) = 17.41
                                                                        *************************
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.017
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 21214.00 TO NODE 21215.00 IS CODE = 63
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                          Aр
                                                  SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                 56
 "2 DWELLINGS/ACRE"
                    B 4.04
                                  0.75
                                           0.700
                                                                       ______
                                                                         UPSTREAM ELEVATION(FEET) = 1540.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 RESIDENTIAL
                                                                         STREET LENGTH (FEET) = 601.35 CURB HEIGHT (INCHES) = 6.0
 "3-4 DWELLINGS/ACRE"
                   B 0.60 0.75
                                           0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA (ACRES) = 4.64 SUBAREA RUNOFF (CFS) = 6.28
                                                                         DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 EFFECTIVE AREA(ACRES) = 31.75 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                         INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
                                                                         OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 31.8 PEAK FLOW RATE (CFS) =
                                                42.64
                                                                         SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                         STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                         Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                         Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
*****************
                                                                         MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 11
                                                                           **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                           ***STREET FLOWING FULL***
_____
                                                                           STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                           STREET FLOW DEPTH(FEET) = 0.64
 ** MAIN STREAM CONFLUENCE DATA **
                                                                          HALFSTREET FLOOD WIDTH (FEET) = 24.79
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                          AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.80
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.32
   1
          42.64 17.41 2.017 0.75(0.52) 0.70 31.7 21213.10
                                                                         STREET FLOW TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 18.88
    2
          42.64 17.41 2.017 0.75(0.52) 0.70 31.8 21210.00
                                                                         * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.921
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
                                                                         SUBAREA LOSS RATE DATA (AMC II):
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA Fp
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                           LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  STREAM
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         RESIDENTIAL
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                         "3-4 DWELLINGS/ACRE" B 0.90 0.75 0.600
                                                                                                                           56
          43.07 27.64 1.529 0.75(0.49) 0.66 46.2 21213.30
                                                                         RESIDENTIAL
```

Date: 04/21/2014

File name: LR0212ZZ.RES

Page 18

Page 17

```
"2 DWELLINGS/ACRE"
                    В
                           8.64 0.75 0.700 56
                                                                       ******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         FLOW PROCESS FROM NODE 21215.00 TO NODE 21216.00 IS CODE = 48
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
                                                                       ______
                            SUBAREA RUNOFF (CFS) = 12.06
 SUBAREA AREA(ACRES) = 9.54
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 70.37 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                       _____
 TOTAL AREA (ACRES) = 87.5
                            PEAK FLOW RATE(CFS) =
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1520.00 DOWNSTREAM(FEET) = 1470.00
                                                                         FLOW LENGTH (FEET) = 1371.54 MANNING'S N = 0.014
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                         FLOWDEPTH IN BOX IS 1.39 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 19.56
                                                                         BOX-FLOW(CFS) = 162.63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 20.05
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.91
                                                                         LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21216.00 = 6824.53 FEET.
 FLOW VELOCITY (FEET/SEC.) = 6.80 DEPTH*VELOCITY (FT*FT/SEC.) = 4.34
                                                                       ************************
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                         FLOW PROCESS FROM NODE 21216.00 TO NODE 21216.00 IS CODE = 81
******************
                                                                        ______
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 11
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                       >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<
                                                                         MAINLINE Tc(MIN.) = 20.05
_____
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.853
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ** MAIN STREAM CONFLUENCE DATA **
                                                                                                                  Ap
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                         Fp
  STREAM
           0
               Tc Intensity Fp(Fm) Ap Ae
                                                  HEADWATER
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                         RESIDENTIAL
    1
          89.36 18.88 1.921 0.75(0.51) 0.68 70.4 21213.10
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                          B 23.70 0.75 0.600
                                           70.4 21210.00
          89.36 18.88 1.921 0.75(0.51) 0.68
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
    3
          76.59 29.18 1.480 0.75(0.51) 0.68
                                           87.5 21213.30
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                         SUBAREA AREA (ACRES) = 23.70 SUBAREA RUNOFF (CFS) = 29.95
                                                                         EFFECTIVE AREA(ACRES) = 151.19 AREA-AVERAGED Fm(INCH/HR) = 0.50
 ** MEMORY BANK # 2 CONFLUENCE DATA **
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
                                                                         TOTAL AREA(ACRES) = 176.7
  STREAM
           0
               Tc Intensity Fp(Fm)
                                       Ар Ае
                                                  HEADWATER
                                                                                                     PEAK FLOW RATE(CFS) =
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
   1
          75.10 21.67 1.769 0.75(0.50) 0.66
                                           65.5 21200.00
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
                                                                         5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 ** PEAK FLOW RATE TABLE **
                                                                         ** PEAK FLOW RATE TABLE **
  STREAM
         0
               Tc Intensity Fp(Fm)
                                       Ap Ae HEADWATER
                                                                                Q Tc Intensity Fp(Fm)
                                                                                                              Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
                                                                          NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                   (ACRES) NODE
    1
         162.63 18.88 1.921 0.75(0.50) 0.67
                                           127.5 21213.10
                                                                          1
                                                                                 185.71 19.93 1.860 0.75(0.50) 0.66
                                                                                                                   151.2 21210.00
    2
         162.63 18.88 1.921 0.75 (0.50) 0.67
                                            127.5 21210.00
                                                                                 185.27 19.99 1.857 0.75(0.50) 0.66
                                                                                                                    151.2 21213.10
                                                                                                                    164.2 21200.00
         161.01 21.67 1.769 0.75(0.50) 0.67
                                            140.5 21200.00
                                                                                 181.35 22.66 1.722 0.75(0.50) 0.66
         134.63 29.18 1.480 0.75(0.50) 0.67
                                                                                 151.92 30.17 1.450 0.75(0.49) 0.66
                                                                                                                    176.7 21213.30
                                           153.0 21213.30
  TOTAL AREA (ACRES) =
                      153.0
                                                                         NEW PEAK FLOW DATA ARE:
                                                                         PEAK FLOW RATE (CFS) = 185.27 Tc (MIN.) = 19.99
                                                                         AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.75
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 162.63 Tc (MIN.) = 18.883
                                                                         AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) =
 EFFECTIVE AREA(ACRES) = 127.49 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                       AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 153.0
                                                                         FLOW PROCESS FROM NODE 21216.00 TO NODE 21217.00 IS CODE = 48
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 12
                                                                       ______
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1470.00 DOWNSTREAM(FEET) = 1415.00
                                                                         FLOW LENGTH (FEET) = 1351.25 MANNING'S N = 0.014
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
                                                                         GIVEN BOX BASEWIDTH (FEET) = 7.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                         FLOWDEPTH IN BOX IS 1.29 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 20.62
```

SCS

56

184.78

Date: 04/21/2014 Date: 04/21/2014 File name: LR0212ZZ.RES File name: LR021277.RFS Page 19 Page 20

```
BOX-FLOW(CFS) = 185.71
                                                                         * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.720
 BOX-FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 21.08
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21217.00 = 8175.78 FEET.
*****************
 FLOW PROCESS FROM NODE 21217.00 TO NODE 21217.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.08
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.798
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                    Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                           12.77 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 12.77 SUBAREA RUNOFF(CFS) = 15.51
 EFFECTIVE AREA(ACRES) = 163.95 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 189.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 ** PEAK FLOW RATE TABLE **
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
         0
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
    1
         193.68 20.97 1.804 0.75(0.49) 0.66
                                           163.9 21213.10
    2
         193.69 20.97 1.804 0.75(0.49) 0.66
                                            164.0 21210.00
         189.39 23.60 1.681 0.75(0.49) 0.66
                                            177.0 21200.00
         158.89 31.12 1.423 0.75(0.49) 0.66
                                            189.5 21213.30
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 193.68 Tc (MIN.) = 20.97
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) = 163.95
******************
 FLOW PROCESS FROM NODE 21217.00 TO NODE 21236.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1358.00
 FLOW LENGTH (FEET) = 1911.29 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 8.00 GIVEN BOX HEIGHT (FEET) = 3.00
 FLOWDEPTH IN BOX IS 1.32 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 18.28
 BOX-FLOW(CFS) =
               193.69
 BOX-FLOW TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 22.71
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
******************
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 22.71
```

```
SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                     SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.73
                                      0.75
                                              0.600
                                                     56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 19.73
                             SUBAREA RUNOFF (CFS) = 22.57
 EFFECTIVE AREA(ACRES) = 183.68 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
                   209.2
 TOTAL AREA (ACRES) =
                               PEAK FLOW RATE(CFS) =
                                                    203.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 ** PEAK FLOW RATE TABLE **
  STREAM
           0
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
   1
          205.17 22.53 1.728 0.75(0.49) 0.65
                                             183.7 21210.00
          204.47 22.62 1.724 0.75(0.49) 0.65
                                               183.7 21213.10
          200.50 25.09 1.620 0.75(0.49) 0.65
                                               196.7 21200.00
          168.69 32.63 1.384 0.75(0.49) 0.65
                                               209.2 21213.30
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 204.47 Tc (MIN.) = 22.62
 AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.65 EFFECTIVE AREA(ACRES) =
******************
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
*************************
 FLOW PROCESS FROM NODE 21220.00 TO NODE 21221.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 765.06
 ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.585
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.719
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               Aр
                                                    SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 PUBLIC PARK
                     B
                              8.02
                                      0.75
                                              0.850
                                                     56 12.41
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                                                     56 11.25
                              0.68
                                      0.75
                                              0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                            0.28
                                      0.75
                                              0.600
                                                     56 10.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.831
 SUBAREA RUNOFF(CFS) = 16.95
 TOTAL AREA (ACRES) =
                     8.98 PEAK FLOW RATE(CFS) =
                                              16.95
```

File name: LR0212ZZ.RES

Page 22

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*****************
 FLOW PROCESS FROM NODE 21221.00 TO NODE 21222.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1515.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 731.02 CHANNEL SLOPE = 0.0889
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             16.95
 FLOW VELOCITY (FEET/SEC.) = 2.96 FLOW DEPTH (FEET) = 0.34
 TRAVEL TIME (MIN.) = 4.12 Tc (MIN.) = 14.71
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21222.00 = 1496.08 FEET.
FLOW PROCESS FROM NODE 21222.00 TO NODE 21222.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 14.71
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.232
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.88
                                    0.75
                                           0.600
                                                 56
 AGRICULTURAL FAIR COVER
                           9.97
 "ORCHARDS"
                                    0.63
                                           1.000
 PUBLIC PARK
                            3.94
                                    0.75
                                           0.850 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 2.50
                                    0.75
                                           0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
 SUBAREA AREA(ACRES) = 17.29
                           SUBAREA RUNOFF (CFS) = 25.29
 EFFECTIVE AREA(ACRES) = 26.27 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 26.3
                           PEAK FLOW RATE(CFS) =
                                                  38.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
******************
 FLOW PROCESS FROM NODE 21222.00 TO NODE 21223.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1515.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
 STREET LENGTH (FEET) = 477.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  46.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.93
 STREET FLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 16.16
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.109
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.55 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 11.55 SUBAREA RUNOFF (CFS) = 17.26
 EFFECTIVE AREA(ACRES) = 37.82 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.79
 TOTAL AREA(ACRES) = 37.8 PEAK FLOW RATE(CFS) =
                                                          52.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.64
 FLOW VELOCITY (FEET/SEC.) = 5.69 DEPTH*VELOCITY (FT*FT/SEC.) = 3.15
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21223.00 = 1973.58 FEET.
******************
 FLOW PROCESS FROM NODE 21223.00 TO NODE 21224.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1500.00 DOWNSTREAM ELEVATION(FEET) = 1480.00
 STREET LENGTH (FEET) = 869.02 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    63.33
```

File name: LR0212ZZ.RES

Page 24

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

Date: 04/21/2014

```
***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.29
 STREET FLOW TRAVEL TIME (MIN.) = 2.68 Tc (MIN.) = 18.85
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.923
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                 Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.47
                                         0.75 0.600
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                                8.69
                                         0.63 1.000 65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803
 SUBAREA AREA (ACRES) = 17.16 SUBAREA RUNOFF (CFS) = 21.35
 EFFECTIVE AREA(ACRES) = 54.98 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 55.0 PEAK FLOW RATE (CFS) =
                                                       67.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.99
 FLOW VELOCITY (FEET/SEC.) = 5.53 DEPTH*VELOCITY (FT*FT/SEC.) = 3.43
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21224.00 = 2842.60 FEET.
******************
 FLOW PROCESS FROM NODE 21224.00 TO NODE 21225.00 IS CODE = 63
-----
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1480.00 DOWNSTREAM ELEVATION(FEET) = 1473.00
 STREET LENGTH (FEET) = 240.38 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.55
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.63
 STREET FLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 19.57
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.880
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αp
                                                    SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.82 0.75 0.600
 AGRICULTURAL FAIR COVER
                           0.13 0.63 1.000
 "ORCHARDS"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.613
 SUBAREA AREA (ACRES) = 3.95 SUBAREA RUNOFF (CFS) = 5.07
 EFFECTIVE AREA(ACRES) = 58.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 58.9 PEAK FLOW RATE (CFS) =
                                                     70.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.77
 FLOW VELOCITY (FEET/SEC.) = 5.58 DEPTH*VELOCITY (FT*FT/SEC.) = 3.65
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21225.00 = 3082.98 FEET.
******************
 FLOW PROCESS FROM NODE 21225.00 TO NODE 21233.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1473.00 DOWNSTREAM(FEET) = 1423.00
 FLOW LENGTH (FEET) = 1355.56 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 1.50
 FLOWDEPTH IN BOX IS 0.79 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 14.89
 BOX-FLOW(CFS) =
                  70.63
 BOX-FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 21.09
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET.
********************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 81
_______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 21.09
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.798
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap
                                                    SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 16.86 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 16.86
                            SUBAREA RUNOFF (CFS) = 20.47
 EFFECTIVE AREA(ACRES) = 75.79 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.74
 TOTAL AREA(ACRES) = 75.8
                                                     86.73
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
```

File name: LR021277.RFS

Page 26

Date: 04/21/2014

```
*******************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.09
 RAINFALL INTENSITY (INCH/HR) = 1.80
 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.74
 EFFECTIVE STREAM AREA(ACRES) = 75.79
 TOTAL STREAM AREA(ACRES) = 75.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 86.73
******************
 FLOW PROCESS FROM NODE 21230.00 TO NODE 21231.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.64
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.384
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.922
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                 Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                          Ap SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
                   В
 "3-4 DWELLINGS/ACRE"
                            4.58
                                    0.75 0.600 56 9.38
                    В
                            0.10
                                    0.75 0.600 56 9.38
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 10.42
 TOTAL AREA(ACRES) = 4.68 PEAK FLOW RATE(CFS) = 10.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
********************
 FLOW PROCESS FROM NODE 21231.00 TO NODE 21232.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 739.29 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 13.31
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.58
 STREET FLOW TRAVEL TIME (MIN.) = 3.31 Tc (MIN.) = 12.70
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.437
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                                 Ар
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.65 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 4.65 SUBAREA RUNOFF(CFS) = 8.32
 EFFECTIVE AREA(ACRES) = 9.33 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 9.3
                                 PEAK FLOW RATE(CFS) =
                                                           16.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 14.13
 FLOW VELOCITY (FEET/SEC.) = 3.82 DEPTH*VELOCITY (FT*FT/SEC.) = 1.68
 LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21232.00 = 1307.93 FEET.
******************
 FLOW PROCESS FROM NODE 21232.00 TO NODE 21233.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1423.00
 STREET LENGTH (FEET) = 666.66 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     23.73
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 19.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
```

File name: LR021277.RFS

Page 28

Date: 04/21/2014

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

STREET FLOW TRAVEL TIME (MIN.) = 3.84 Tc (MIN.) = 16.54 TOTAL AREA (ACRES) = 94.7 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.080 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET. SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN FLOW PROCESS FROM NODE 21233.00 TO NODE 21234.00 IS CODE = 48 LAND USE RESIDENTIAL \_\_\_\_\_\_ "3-4 DWELLINGS/ACRE" B 9.55 0.75 0.600 56 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>> \_\_\_\_\_ SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA (ACRES) = 9.55 SUBAREA RUNOFF (CFS) = 14.02 ELEVATION DATA: UPSTREAM(FEET) = 1423.00 DOWNSTREAM(FEET) = 1373.00 EFFECTIVE AREA(ACRES) = 18.88 AREA-AVERAGED Fm(INCH/HR) = 0.45 FLOW LENGTH (FEET) = 1343.35 MANNING'S N = 0.014AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60GIVEN BOX BASEWIDTH (FEET) = 8.00 GIVEN BOX HEIGHT (FEET) = 1.50 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = FLOWDEPTH IN BOX IS 0.86 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.16 BOX-FLOW(CFS) = 110.84SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): BOX-FLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 17.92 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21234.00 = 5781.89 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.02 FLOW PROCESS FROM NODE 21234.00 TO NODE 21234.00 IS CODE = 81 FLOW VELOCITY (FEET/SEC.) = 3.01 DEPTH\*VELOCITY (FT\*FT/SEC.) = 1.74 \_\_\_\_\_ LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21233.00 = 1974.59 FEET. >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* MAINLINE Tc(MIN.) = 17.92FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.982 \_\_\_\_\_ SUBAREA LOSS RATE DATA (AMC II): >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<< DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES< LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN \_\_\_\_\_ RESIDENTIAL "3-4 DWELLINGS/ACRE" B 30.53 0.75 0.600 TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 TIME OF CONCENTRATION (MIN.) = 16.54RAINFALL INTENSITY (INCH/HR) = 2.08SUBAREA AREA(ACRES) = 30.53 SUBAREA RUNOFF (CFS) = 42.13EFFECTIVE AREA(ACRES) = 108.85 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fm(INCH/HR) = 0.45AREA-AVERAGED Fp(INCH/HR) = 0.75AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.68 AREA-AVERAGED Ap = 0.60TOTAL AREA(ACRES) = 125.2 PEAK FLOW RATE (CFS) = 146.06 EFFECTIVE STREAM AREA(ACRES) = 18.88 TOTAL STREAM AREA(ACRES) = 18.88 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): PEAK FLOW RATE (CFS) AT CONFLUENCE = 27.72 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26 \*\* CONFLUENCE DATA \*\* \*\* PEAK FLOW RATE TABLE \*\* Q Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM Q Tc Intensity Fp(Fm) Ap Ae NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 86.73 21.09 1.798 0.71(0.53)0.74 75.8 21220.00 1 146.54 17.85 1.987 0.72(0.49) 0.68 108.9 21230.00 27.72 16.54 2.080 0.75(0.45) 0.60 18.9 21230.00 2 139.84 22.34 1.737 0.72(0.50) 0.69 NEW PEAK FLOW DATA ARE: RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO PEAK FLOW RATE (CFS) = 146.54 Tc (MIN.) = 17.85CONFLUENCE FORMULA USED FOR 2 STREAMS. AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.68 EFFECTIVE AREA(ACRES) = 108.85 \*\* PEAK FLOW RATE TABLE \*\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE FLOW PROCESS FROM NODE 21234.00 TO NODE 21235.00 IS CODE = 48 110.84 16.54 2.080 0.72(0.51) 0.71 78.3 21230.00 -----1 109.66 21.09 1.798 0.72(0.51) 0.71 94.7 21220.00 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA< >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>> COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: \_\_\_\_\_ PEAK FLOW RATE (CFS) = 110.84 Tc (MIN.) = 16.54 ELEVATION DATA: UPSTREAM(FEET) = 1373.00 DOWNSTREAM(FEET) = 1359.00 EFFECTIVE AREA(ACRES) = 78.32 AREA-AVERAGED Fm(INCH/HR) = 0.51 FLOW LENGTH (FEET) = 833.47 MANNING'S N = 0.014

Page 29

AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.71

File name: LR021277.RFS

Date: 04/21/2014

Date: 04/21/2014 File name: LR0212ZZ.RES Page 30

GIVEN BOX BASEWIDTH (FEET) = 15.00 GIVEN BOX HEIGHT (FEET) = 1.50

SCS

HEADWATER

125.2 21220.00

```
FLOWDEPTH IN BOX IS 0.85 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 11.50
                                                                        ** MAIN STREAM CONFLUENCE DATA **
 BOX-FLOW(CFS) = 146.54
                                                                                0
                                                                         STREAM
                                                                                        Tc Intensity Fp(Fm)
                                                                                                            Ар Ае
 BOX-FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 19.06
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 160.40 19.60
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21235.00 = 6615.36 FEET.
                                                                         1
                                                                                             1.879 0.73(0.47) 0.65 123.3 21230.00
                                                                                             1.662 0.72(0.48) 0.66 139.7 21220.00
                                                                                 152.27 24.03
LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.
 FLOW PROCESS FROM NODE 21235.00 TO NODE 21235.00 IS CODE = 81
______
                                                                        ** MEMORY BANK # 1 CONFLUENCE DATA **
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                 Q
                                                                                      Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR)
______
                                                                         NUMBER
                                                                                                                 (ACRES) NODE
                                                                                 205.17 22.53 1.728 0.75(0.49) 0.65 183.7 21210.00
 MAINLINE Tc(MIN.) = 19.06
                                                                          1
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.910
                                                                           2
                                                                                 204.47 22.62
                                                                                            1.724 0.75 ( 0.49) 0.65 183.7 21213.10
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 200.50 25.09 1.620 0.75(0.49) 0.65 196.7 21200.00
                                                                                 168.69 32.63 1.384 0.75(0.49) 0.65 209.2 21213.30
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          Ар
                                                 SCS
                                                                           4
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                        LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
                                           0.250
 MOBILE HOME PARK
                   В 8.16
                                    0.75
 RESIDENTIAL
                                                                        ** PEAK FLOW RATE TABLE **
 "3-4 DWELLINGS/ACRE" B 6.30
                                  0.75 0.600 56
                                                                                  0
                                                                                       Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         STREAM
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         NUMBER
                                                                                (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
                                                                          1
                                                                                 360.55 19.60 1.879 0.74(0.48) 0.65
 SUBAREA AREA (ACRES) = 14.46 SUBAREA RUNOFF (CFS) = 20.94
                                                                                 360.18 22.53 1.728 0.74(0.48) 0.65
 EFFECTIVE AREA(ACRES) = 123.31 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                                 359.32 22.62 1.724 0.74(0.48) 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.65
                                                                                 354.48 24.03 1.662 0.74(0.48) 0.65
 TOTAL AREA (ACRES) = 139.7 PEAK FLOW RATE (CFS) = 159.99
                                                                           5
                                                                                 347.30 25.09
                                                                                             1.620 0.74(0.48) 0.65
                                                                                 285.18 32.63 1.384 0.74(0.48) 0.65
                                                                                              348.9
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          TOTAL AREA (ACRES) =
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                        COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 ** PEAK FLOW RATE TABLE **
                                                                        PEAK FLOW RATE (CFS) = 360.55 Tc (MIN.) = 19.596
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                        EFFECTIVE AREA(ACRES) = 283.08 AREA-AVERAGED Fm(INCH/HR) = 0.48
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.65
   1
         160.40 18.99 1.914 0.73 (0.47) 0.65 123.3 21230.00
                                                                        TOTAL AREA (ACRES) =
                                                                                         348.9
         152.27 23.45 1.687 0.72(0.48) 0.66 139.7 21220.00
                                                                        LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 160.40 Tc (MIN.) = 18.99
                                                                       *************************
 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.73
                                                                        FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 12
 AREA-AVERAGED Ap = 0.65 EFFECTIVE AREA(ACRES) = 123.31
                                                                        >>>>CLEAR MEMORY BANK # 1 <<<<<
*******************
                                                                       ______
 FLOW PROCESS FROM NODE 21235.00 TO NODE 21236.00 IS CODE = 48
                                                                       *******************
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                        FLOW PROCESS FROM NODE 21236.00 TO NODE 21246.00 IS CODE = 48
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
                                                                        >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 ELEVATION DATA: UPSTREAM(FEET) = 1359.00 DOWNSTREAM(FEET) = 1358.00
                                                                        >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 FLOW LENGTH (FEET) = 230.02 MANNING'S N = 0.014
                                                                       GIVEN BOX BASEWIDTH (FEET) = 31.00 GIVEN BOX HEIGHT (FEET) = 1.50
                                                                        ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1311.00
 FLOWDEPTH IN BOX IS 0.85 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 6.08
                                                                        FLOW LENGTH (FEET) = 1973.53 MANNING'S N = 0.014
 BOX-FLOW(CFS) =
               160.40
                                                                        GIVEN BOX BASEWIDTH (FEET) = 9.00 GIVEN BOX HEIGHT (FEET) = 4.00
 BOX-FLOW TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 19.63
                                                                        FLOWDEPTH IN BOX IS 1.98 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 20.24
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.
                                                                        BOX-FLOW(CFS) =
                                                                                       360.55
                                                                        BOX-FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 21.22
******************
                                                                        LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21246.00 = 12060.60 FEET.
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 11
                                                                       >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                        FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 81
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

Page 31

Date: 04/21/2014

File name: LR021277.RFS

Date: 04/21/2014 File name: LR0212ZZ.RES Page 32

HEADWATER

283.1 21230.00

317.8 21210.00

318.1 21213.10

330.8 21220.00

336.4 21200.00

348.9 21213.30

```
ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1518.00
_____
 MAINLINE Tc (MIN.) = 21.22
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.791
                                                                             Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.728
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                             * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.697
                                      Fρ
                                             Дp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             SUBAREA To AND LOSS RATE DATA (AMC II):
 RESIDENTIAL
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fρ
                                                                                                                         Αp
                                                                                                                                SCS Tc
                                                                                 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 "3-4 DWELLINGS/ACRE" B 20.64
                                              0.600 56
                                      0.75
                     в 3.79
                                              0.100 56
 COMMERCIAL
                                      0.75
                                                                             RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B
                                              0.250 56
                                                                                                        6.78 0.75 0.600 56 10.73
 MOBILE HOME PARK
                     в 30.62
                                      0.75
 PUBLIC PARK
                     В
                            2.31
                                      0.75 0.850 56
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390
                                                                             SUBAREA RUNOFF (CFS) = 13.72
                                                                             TOTAL AREA(ACRES) = 6.78 PEAK FLOW RATE(CFS) = 13.72
 SUBAREA AREA (ACRES) = 57.36 SUBAREA RUNOFF (CFS) = 77.39
 EFFECTIVE AREA(ACRES) = 340.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 406.2 PEAK FLOW RATE (CFS) = 411.67
                                                                             5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                           ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
                                                                             FLOW PROCESS FROM NODE 21241.00 TO NODE 21242.00 IS CODE = 63
  ** PEAK FLOW RATE TABLE **
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                            >>>> (STREET TABLE SECTION # 18 USED) <<<<
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                           ______
    1
          413.03 21.13 1.796 0.74(0.45) 0.61 340.4 21230.00
                                                                             UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1465.00
          409.22 23.99 1.664 0.74(0.45) 0.61 375.2 21210.00
                                                                             STREET LENGTH (FEET) = 1349.95 CURB HEIGHT (INCHES) = 8.0
                                              375.5 21213.10
          409.37 24.00 1.664 0.74(0.45) 0.61
                                                                             STREET HALFWIDTH (FEET) = 26.00
          403.87 25.34 1.610 0.74(0.45) 0.61
                                              388.1 21220.00
          396.35 26.34 1.573 0.74(0.45) 0.62
                                              393.7 21200.00
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
          327.77 33.89 1.352 0.74(0.46) 0.62
                                               406.2 21213.30
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 NEW PEAK FLOW DATA ARE:
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 PEAK FLOW RATE (CFS) = 413.03 Tc (MIN.) = 21.13
 AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.74
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 AREA-AVERAGED Ap = 0.61 EFFECTIVE AREA(ACRES) = 340.44
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
 FLOW PROCESS FROM NODE 21246.00 TO NODE 212146.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                              **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                            24.50
_____
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 TOTAL NUMBER OF STREAMS = 2
                                                                              STREET FLOW DEPTH (FEET) = 0.46
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 15.31
 TIME OF CONCENTRATION (MIN.) = 21.13
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.84
 RAINFALL INTENSITY (INCH/HR) = 1.80
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.25
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 4.65 Tc (MIN.) = 15.38
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.74
                                                                             * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.173
 AREA-AVERAGED Ap = 0.61
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 EFFECTIVE STREAM AREA(ACRES) = 340.44
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fр
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TOTAL STREAM AREA(ACRES) = 406.21
                                                                                LAND USE
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 413.03
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" B 13.82
                                                                                                                 0.75 0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  FLOW PROCESS FROM NODE 21240.00 TO NODE 21241.00 IS CODE = 21
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
______
                                                                             SUBAREA AREA (ACRES) = 13.82 SUBAREA RUNOFF (CFS) = 21.44
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                             EFFECTIVE AREA(ACRES) = 20.60 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
                                                                             TOTAL AREA (ACRES) = 20.6 PEAK FLOW RATE(CFS) = 31.96
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 726.27
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 33 Date: 04/21/2014 File name: LR0212ZZ.RES Page 34

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 17.06
 FLOW VELOCITY(FEET/SEC.) = 5.15 DEPTH*VELOCITY(FT*FT/SEC.) = 2.57
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21242.00 = 2076.22 FEET.
******************
 FLOW PROCESS FROM NODE 21242.00 TO NODE 21243.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1465.00 DOWNSTREAM ELEVATION(FEET) = 1420.00
 STREET LENGTH (FEET) = 1314.48 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 19.53
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.85
 STREET FLOW TRAVEL TIME (MIN.) = 4.22 Tc (MIN.) = 19.60
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.878
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              αA
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 14.61
                                        0.75 0.600 56
                             0.19
                                      0.75 0.100 56
 COMMERCIAL
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
 SUBAREA AREA (ACRES) = 14.80 SUBAREA RUNOFF (CFS) = 19.11
 EFFECTIVE AREA(ACRES) = 35.40 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 35.4 PEAK FLOW RATE(CFS) = 45.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.23
 FLOW VELOCITY (FEET/SEC.) = 5.33 DEPTH*VELOCITY (FT*FT/SEC.) = 3.00
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21243.00 = 3390.70 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1420.00 DOWNSTREAM ELEVATION(FEET) = 1372.00
 STREET LENGTH (FEET) = 1306.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    53.76
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.28
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.70
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.33
 STREET FLOW TRAVEL TIME (MIN.) = 3.82 Tc (MIN.) = 23.42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.688
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.60 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.60 SUBAREA RUNOFF (CFS) = 16.28
 EFFECTIVE AREA(ACRES) = 50.00 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 50.0 PEAK FLOW RATE (CFS) = 55.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.63
 FLOW VELOCITY (FEET/SEC.) = 5.73 DEPTH*VELOCITY (FT*FT/SEC.) = 3.39
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21244.00 = 4696.72 FEET.
******************
 FLOW PROCESS FROM NODE 21244.00 TO NODE 21245.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1372.00 DOWNSTREAM ELEVATION(FEET) = 1330.00
 STREET LENGTH (FEET) = 1339.26 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
```

File name: LR0212ZZ.RES

Page 36

Date: 04/21/2014

FLOW PROCESS FROM NODE 21243.00 TO NODE 21244.00 IS CODE = 63

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     LAND USE
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.57
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE"
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.51
                                                                                 MOBILE HOME PARK
 STREET FLOW TRAVEL TIME (MIN.) = 4.00 Tc (MIN.) = 27.42
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.536
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.63 0.75 0.600 56
 SCHOOL
                      В
                             5.33 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 16.96 SUBAREA RUNOFF(CFS) = 16.59
 EFFECTIVE AREA(ACRES) = 66.96 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 67.0 PEAK FLOW RATE (CFS) = 65.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 23.74
 FLOW VELOCITY (FEET/SEC.) = 5.63 DEPTH*VELOCITY (FT*FT/SEC.) = 3.56
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21245.00 = 6035.98 FEET.
********************
 FLOW PROCESS FROM NODE 21245.00 TO NODE 21246.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 AREA-AVERAGED Ap = 0.58
_____
 UPSTREAM ELEVATION(FEET) = 1330.00 DOWNSTREAM ELEVATION(FEET) = 1311.00
 STREET LENGTH(FEET) = 939.73 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 ** CONFLUENCE DATA **
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  1
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    1
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                69.39
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.68
  HALFSTREET FLOOD WIDTH (FEET) = 26.91
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.86
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.33
 STREET FLOW TRAVEL TIME (MIN.) = 3.22 Tc (MIN.) = 30.64
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.437
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    B 2.70 0.75 0.600
                    B 4.66 0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 SUBAREA AREA (ACRES) = 7.36 SUBAREA RUNOFF (CFS) = 7.64
 EFFECTIVE AREA(ACRES) = 74.32 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 74.3 PEAK FLOW RATE (CFS) = 67.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.68 HALFSTREET FLOOD WIDTH (FEET) = 26.67
 FLOW VELOCITY (FEET/SEC.) = 4.80 DEPTH*VELOCITY (FT*FT/SEC.) = 3.27
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21246.00 = 6975.71 FEET.
******************
 FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 30.64
 RAINFALL INTENSITY (INCH/HR) = 1.44
 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 74.32
 TOTAL STREAM AREA(ACRES) = 74.32
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 67.24
 STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          413.03 21.13 1.796 0.74(0.45) 0.61 340.4 21230.00
          409.22 23.99 1.664 0.74(0.45) 0.61
                                               375.2 21210.00
          409.37 24.00 1.664 0.74(0.45) 0.61
                                               375.5 21213.10
          403.87 25.34 1.610 0.74(0.45) 0.61
                                               388.1 21220.00
          396.35 26.34 1.573 0.74(0.45) 0.62
                                               393.7 21200.00
          327.77 33.89 1.352 0.74(0.46) 0.62
                                               406.2 21213.30
          67.24 30.64 1.437 0.75(0.43) 0.58 74.3 21240.00
```

File name: LR0212ZZ.RES

Page 38

Date: 04/21/2014

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

COMITODING	on rondonn	ODED IC	/IC 2 DIICH	. 1110					
** DENV I	LOW RATE	ייוסגיי +∗							
	Q Q			En (1		Δn	7.0	HEY DWY T	FD
NIIMBER	(CES)	(MTN )	(INCH/HR)	(TNCH	/HR)	лþ	(ACRES)	NODE	TIT/
1	(CFS) 475.96	21.13	1.796	0.74(	0.45)	0.60	391.7	21230	.00
2	473.76	23.99	1.664	0.74(	0.45)	0.61	433.4	21210	.00
3	473.92	24.00	1.664	0.74(	0.45)	0.61	433.7	21213	.10
4	469.07	25.34	1.610	0.74(	0.45)	0.61	449.6	21220	.00
5	462.00	26.34	1.573	0.74(	0.45)	0.61	457.6	21200	.00
6	473.76 473.92 469.07 462.00 424.54	30.64	1.437	0.74(	0.45)	0.61	475.2	21240	.00
7	389.37	33.89	1.352	0.74(	0.45)	0.61	480.5	21213	.30
COMPLIED	CONETHENC	е есптил	mec and a	C EOIT	NIC.				
	COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 475.96 Tc (MIN.) = 21.13								
	E AREA (ACRI							= 0.45	
AREA-AVE	RAGED Fp(II	MCH/HB/	= 0.74	ΑΠΕΑ-ΔΙ	/ERACE	D An =	0 60	- 0.43	
	EA(ACRES) =			.11(1111 11	V LIWIOL.	D 11p	0.00		
	FLOWPATH FI			0 TO NO	DDE 2	1246.00	) = 120	60.60 FE	ET.
******	*****	*****	*****	*****	*****	*****	*****	*****	****
	CESS FROM 1					.00 IS	CODE =	48	
	TIME DOV E								
	PUTE BOX-FI IG USER-SPI								
				•		,			====
	I DATA: UPS								
	GTH(FEET) =	,	,				(1111)	1230.00	
							(FEET) =	4.00	
	GIVEN BOX BASEWIDTH(FEET) = 12.00 GIVEN BOX HEIGHT(FEET) = 4.00 FLOWDEPTH IN BOX IS 2.14 FEET BOX-FLOW VELOCITY(FEET/SEC.) = 18.54								
	(CFS) =								
BOX-FLOW	TRAVEL TIM	ME (MIN.)	= 1.13	Tc	(MIN.)	= 22	2.26		
LONGEST E	FLOWPATH F	ROM NODE	21213.3	O TO NO	DDE 2	1247.00	) = 133	19.44 FE	ET.
******									****
FLOW PROC	LESS FROM I	NODE ZI	.247.00 TO	NODE	21247	.00 15	CODE =	91 B1	
>>>>ADD1	TION OF SU	JBAREA T	O MAINLIN	E PEAK	FLOW<	<<<<			
========									====
MAINLINE	Tc(MIN.) =	= 22.2	26						
* 25 YEA	AR RAINFAL	L INTENS	SITY(INCH/	HR) =	1.740				
	LOSS RATE I								
DEVELOPM	MENT TYPE/ D USE	SC	S SOIL	AREA	Fp		Аp	SCS	
LANI	USE	(	GROUP (A	CRES)	(INCH	/HR)	(DECIMAL)	CN	
RESIDENT	IAL .								
"3-4 DWEI	LLINGS/ACR	Ε"	В :	23.54	0	.75	0.600	56	
COMMERCIA	LLINGS/ACRI AL DME PARK		В	1.26	0	.75	0.100	56	
			В	0.22	0	. /5	0.250	56	
	JRAL FAIR (	JOVER	D	1 00	^	62	1 000	C.E.	
"ORCHARDS		יייי אוויייי					1.000	ОЭ	
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600									
SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.000 SUBAREA AREA(ACRES) = 26.82 SUBAREA RUNOFF(CFS) = 31.35									
EFFECTIVE AREA (ACRES) = 418.51 AREA-AVERAGED Fm(INCH/HR) = 0.45									
	RAGED Fp(II							0.10	
	EA(ACRES) =							487.81	
	. ,						•		

5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 488.88 22.20 1.743 0.74(0.45) 0.60 418.5 21230.00 487.36 24.96 1.625 0.74(0.45) 0.61 460.5 21213.10 460.2 21210.00 486.33 25.00 1.623 0.74(0.45) 0.61 482.74 26.25 1.576 0.74(0.45) 0.61 476.4 21220.00 476.06 27.21 1.543 0.74(0.45) 0.61 484.5 21200.00 434.72 31.49 1.413 0.74(0.45) 0.61 502.0 21240.00 402.44 34.72 1.333 0.74 (0.45) 0.61 507.4 21213.30 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 488.88 Tc (MIN.) = 22.20 AREA-AVERAGED Fm (INCH/HR) = 0.45 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA(ACRES) = \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 10 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<< \_\_\_\_\_ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 15.1 >>>>DEFINE MEMORY BANK # 2 <<<< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 21167.DNA MEMORY BANK # 2 DEFINED AS FOLLOWS: PEAK FLOW RATE (CFS) = 711.09 Tc (MIN.) = 30.63AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.57TOTAL AREA (ACRES) = 741.4 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 14.0 \_\_\_\_\_\_ >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY< \_\_\_\_\_ MAIN-STREAM MEMORY DEFINED AS FOLLOWS: PEAK FLOW RATE (CFS) = 711.09 Tc (MIN.) = 30.63AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.57TOTAL AREA (ACRES) = 741.4 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET. FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 2 <<<< \_\_\_\_\_\_ FLOW PROCESS FROM NODE 21167.00 TO NODE 21147.00 IS CODE = 42 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<

File name: LR0212ZZ.RES

Page 40

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

```
>>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1320.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1290.00
 FLOW LENGTH (FEET) = 1357.45 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
                                                                                STREAM
 DEPTH OF FLOW IN 90.0 INCH PIPE IS 51.4 INCHES
                                                                                NUMBER
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.24
                                                                                  1
 PIPE-FLOW(CFS) = 711.09
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 31.46
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21147.00 = 15122.94 FEET.
******************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 31.46
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.414
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                   В
                               0.01
                                        0.75
                                               0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               7.68
                                        0.75
                                               0.600
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               2.53
                                        0.63
                                              1.000 65
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699
 SUBAREA AREA (ACRES) = 10.22
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.75;1H= 0.98;3H= 1.59;6H= 2.16;24H= 4.34
 S-GRAPH: VALLEY(DEV.) = 92.2%; VALLEY(UNDEV.) / DESERT = 7.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.49; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 751.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280; Lca/L=0.6,n=.0262
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 129.41
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 716.97
 TOTAL AREA (ACRES) = 751.6 PEAK FLOW RATE (CFS) = 716.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 41

PEAK FLOW RATE (CFS) = 716.97 Tc (MIN.) = 31.46AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.57TOTAL AREA (ACRES) = 751.6 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET. \*\* MEMORY BANK # 1 CONFLUENCE DATA \*\* Tc Intensity Fp(Fm) Ap Ae HEADWATER 0 (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 488.88 22.20 1.743 0.74(0.45) 0.60 418.5 21230.00 487.36 24.96 1.625 0.74(0.45)0.61 460.5 21213.10 460.2 21210.00 486.33 25.00 1.623 0.74(0.45) 0.61 482.74 26.25 1.576 0.74(0.45) 0.61 476.4 21220.00 476.06 27.21 1.543 0.74(0.45) 0.61 484.5 21200.00 434.72 31.49 1.413 0.74(0.45) 0.61 502.0 21240.00 402.44 34.72 1.333 0.74(0.45) 0.61 507.4 21213.30 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21247.00 = 13319.44 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.58;6H= 2.15;24H= 4.31 S-GRAPH: VALLEY (DEV.) = 93.7%; VALLEY (UNDEV.) / DESERT= 6.3% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.48; Ybar = 0.55 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1259.0 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280; Lca/L=0.6,n=.0262 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 220.33 PEAK FLOW RATE (CFS) = 1174.99 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<<< \_\_\_\_\_ \* FLOW PROCESS FROM NODE 21247.00 TO NODE 21248.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1290.00 DOWNSTREAM(FEET) = 1280.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 452.82 CHANNEL SLOPE = 0.0221 CHANNEL BASE (FEET) = 9.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50 CHANNEL FLOW THRU SUBAREA(CFS) = 1174.99 FLOW VELOCITY (FEET/SEC.) = 24.15 FLOW DEPTH (FEET) = 3.17 TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 31.77

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.

FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 42

```
MAINLINE Tc(MIN.) = 31.77
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.406
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                             Αp
                                                   SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                    в 37.17
                                     0.75
                                             0.250 56
                     В
 COMMERCIAL
                            10.19
                                      0.75
                                             0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           34.08
                                     0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 SUBAREA AREA(ACRES) = 81.44
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.58;6H= 2.14;24H= 4.31
 S-GRAPH: VALLEY (DEV.) = 94.1%; VALLEY (UNDEV.) / DESERT= 5.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.53; LAG(HR) = 0.42; Fm(INCH/HR) = 0.46; Ybar = 0.54
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0335; Lca/L=0.4, n=.0301; Lca/L=0.5, n=.0276; Lca/L=0.6, n=.0258
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 239.65
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1253.07
 TOTAL AREA (ACRES) = 1340.4
                           PEAK FLOW RATE (CFS) = 1253.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26
*******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
_____
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1340.4 TC (MIN.) =
                                         31.77
 AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.54
 PEAK FLOW RATE (CFS) = 1253.07
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 43 Date: 04/21/2014 File name: LR0212ZZ.RES Page 44

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2012 Advanced Engineering Software (aes)
Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

IOD HYDDOLOGY TO MODE 21270

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21378

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0213ZZ.DAT

TIME/DATE OF STUDY: 08:04 11/19/2013

------

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 25.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9600

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======		=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21300.00 TO NODE 21301.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11 ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.759 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" В 3.89 0.75 0.700 56 10.98 RESIDENTIAL "3-4 DWELLINGS/ACRE" В 1.29 0.75 0.600 56 10.33 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF (CFS) = 10.515.18 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 10.51 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21301.00 TO NODE 21302.00 IS CODE = 63 \_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00 STREET LENGTH (FEET) = 166.02 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00

Date: 04/21/2014 File name: LR0213ZZ.RES Page 1 Date: 04/21/2014 File name: LR0213ZZ.RES Page 2

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 14.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.24
 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 11.24
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.623
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                      Fρ
                                               qА
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.06 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA (ACRES) = 2.35 SUBAREA RUNOFF (CFS) = 4.46
 EFFECTIVE AREA(ACRES) = 7.53 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 7.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.68
 FLOW VELOCITY (FEET/SEC.) = 3.15 DEPTH*VELOCITY (FT*FT/SEC.) = 1.32
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21302.00 = 868.13 FEET.
******************
 FLOW PROCESS FROM NODE 21302.00 TO NODE 21303.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1627.00 DOWNSTREAM ELEVATION(FEET) = 1623.00
 STREET LENGTH (FEET) = 202.20 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.37
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.43
   HALFSTREET FLOOD WIDTH (FEET) = 15.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.36
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.45
 STREET FLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 12.24
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.492
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 1.93 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.36 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 2.29 SUBAREA RUNOFF (CFS) = 4.08
 EFFECTIVE AREA(ACRES) = 9.82 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 9.8 PEAK FLOW RATE (CFS) = 17.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.70
 FLOW VELOCITY (FEET/SEC.) = 3.39 DEPTH*VELOCITY (FT*FT/SEC.) = 1.49
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21303.00 = 1070.33 FEET.
*****************
 FLOW PROCESS FROM NODE 21303.00 TO NODE 21304.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1623.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 190.38 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.12
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.35
   HALFSTREET FLOOD WIDTH (FEET) = 11.24
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.92
```

Page 4

Date: 04/21/2014 File name: LR0213ZZ.RES Page 3 Date: 04/21/2014 File name: LR0213ZZ.RES

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.43
                                                                                RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 12.70
                                                                                "2 DWELLINGS/ACRE"
                                                                                                  B 3.59 0.75 0.700 56
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.438
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AREA (ACRES) = 4.39 SUBAREA RUNOFF (CFS) = 7.30
                                       Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                EFFECTIVE AREA(ACRES) = 16.04 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.38
                                        0.75
                                                0.700
                                                                                TOTAL AREA (ACRES) = 16.0 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA (ACRES) = 1.83 SUBAREA RUNOFF (CFS) = 3.18
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 11.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.21
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.24 DEPTH*VELOCITY (FT*FT/SEC.) = 2.56
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) =
                                                        20.23
                                                                                LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21305.00 = 1528.16 FEET.
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
                                                                                FLOW PROCESS FROM NODE 21305.00 TO NODE 21306.00 IS CODE = 63
                                                                               ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.36 HALFSTREET FLOOD WIDTH(FEET) = 11.48
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 7.05 DEPTH*VELOCITY (FT*FT/SEC.) = 2.51
                                                                               _____
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21304.00 = 1260.71 FEET.
                                                                                UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1555.00
                                                                                STREET LENGTH (FEET) = 439.49 CURB HEIGHT (INCHES) = 6.0
******************
                                                                                STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21304.00 TO NODE 21305.00 IS CODE = 63
______
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 267.45 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.46
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET FLOW DEPTH (FEET) = 0.46
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 16.79
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.04
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.79
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 14.64
                                                                                * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.238
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fp
   STREET FLOW DEPTH (FEET) = 0.40
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 13.59
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                     в 8.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.08
                                                                                                                       0.75
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.42
                                                                                RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 13.43
                                                                                "3-4 DWELLINGS/ACRE" B 2.29 0.75 0.600
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.357
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.680
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                       SCS
                                                                                SUBAREA AREA (ACRES) = 11.28 SUBAREA RUNOFF (CFS) = 17.55
                                                                                EFFECTIVE AREA(ACRES) = 27.32 AREA-AVERAGED Fm(INCH/HR) = 0.51
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 "3-4 DWELLINGS/ACRE" B
                               0.80
                                        0.75
                                                0.600 56
                                                                                TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) =
```

Date: 04/21/2014 File name: LR0213ZZ.RES Date: 04/21/2014 File name: LR0213ZZ.RES Page 5 Page 6

26.68

0.700

56

42.51

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 6.31 DEPTH*VELOCITY (FT*FT/SEC.) = 3.07
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21306.00 = 1967.65 FEET.
**********************
 FLOW PROCESS FROM NODE 21306.00 TO NODE 21307.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1555.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
 STREET LENGTH (FEET) = 430.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 18.68
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.57
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 15.68
  * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.148
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Ap SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.82 0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 11.14 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA(ACRES) = 14.96 SUBAREA RUNOFF(CFS) = 22.13
 EFFECTIVE AREA(ACRES) = 42.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 42.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.66
 FLOW VELOCITY (FEET/SEC.) = 7.38 DEPTH*VELOCITY (FT*FT/SEC.) = 3.93
```

```
******************
 FLOW PROCESS FROM NODE 21307.00 TO NODE 21308.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 STREET LENGTH (FEET) = 417.62 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  69.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 24.12
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.63
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.50
 STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 16.91
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.052
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                              αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.69 0.75 0.600
                                                       56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 6.54 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.664
 SUBAREA AREA (ACRES) = 10.23 SUBAREA RUNOFF (CFS) = 14.32
 EFFECTIVE AREA(ACRES) = 52.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 52.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.54
 FLOW VELOCITY (FEET/SEC.) = 5.72 DEPTH*VELOCITY (FT*FT/SEC.) = 3.61
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21308.00 = 2815.85 FEET.
****************
 FLOW PROCESS FROM NODE 21308.00 TO NODE 21309.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21307.00 = 2398.23 FEET.

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 7

Page 8

```
_____
 UPSTREAM NODE ELEVATION (FEET) = 1520.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1445.00
 FLOW LENGTH (FEET) = 2140.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 19.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.36
 PIPE-FLOW(CFS) = 73.12
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 18.86
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21309.00 = 4956.48 FEET.
******************
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21309.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 18.86
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.923
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 52.35 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 52.35 SUBAREA RUNOFF(CFS) = 69.44
 EFFECTIVE AREA(ACRES) = 104.86 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) = 104.9 PEAK FLOW RATE (CFS) = 136.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*******************
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21310.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1445.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1415.00
 FLOW LENGTH (FEET) = 762.02 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 24.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.42
 PIPE-FLOW(CFS) = 136.42
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 19.42
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21310.00 = 5718.50 FEET.
******************
 FLOW PROCESS FROM NODE 21310.00 TO NODE 21310.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
```

```
MAINLINE Tc(MIN.) = 19.42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.889
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                            Аp
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 18.20 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 18.20
                            SUBAREA RUNOFF (CFS) = 23.59
 EFFECTIVE AREA(ACRES) = 123.06 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 123.1
                               PEAK FLOW RATE(CFS) =
                                                  156.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
**********************
 FLOW PROCESS FROM NODE 21310.00 TO NODE 21311.00 IS CODE = 42
_______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1415.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1356.00
 FLOW LENGTH (FEET) = 1371.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 25.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 23.97
 PIPE-FLOW(CFS) = 156.82
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 20.38
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21311.00 = 7089.84 FEET.
******************
 FLOW PROCESS FROM NODE 21311.00 TO NODE 21311.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
MAINLINE Tc(MIN.) = 20.38
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.835
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.39 0.75 0.600
                            10.62 0.75 0.600 56
 SCHOOL
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 30.01
                             SUBAREA RUNOFF (CFS) = 37.44
 EFFECTIVE AREA(ACRES) = 153.07 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA(ACRES) = 153.1
                               PEAK FLOW RATE(CFS) =
                                                    188.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 9 Date: 04/21/2014 File name: LR0213ZZ.RES Page 10

```
******************
 FLOW PROCESS FROM NODE 21311.00 TO NODE 21312.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1356.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1310.00
 FLOW LENGTH (FEET) = 1393.37 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 28.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.72
 PIPE-FLOW(CFS) = 188.33
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 21.40
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21312.00 = 8483.21 FEET.
********************
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21312.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 21.40
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.782
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fρ
                                              Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B
                            77.43
                                      0.75
                                             0.600
                                                   56
                      B
                             5.45
 SCHOOL
                                     0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 82.88
                             SUBAREA RUNOFF (CFS) = 99.45
 EFFECTIVE AREA(ACRES) = 235.95 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 235.9
                            PEAK FLOW RATE(CFS) =
                                                   280.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21313.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1310.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1285.00
 FLOW LENGTH (FEET) = 759.92 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 33.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 25.08
 PIPE-FLOW(CFS) = 280.47
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.50 Tc (MIN.) = 21.90
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21313.00 = 9243.13 FEET.
```

```
FLOW PROCESS FROM NODE 21313.00 TO NODE 21313.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 21.90
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.757
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                             Αр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            10.40
                                  0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 10.40
                          SUBAREA RUNOFF (CFS) = 12.25
 EFFECTIVE AREA(ACRES) = 246.35 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 246.3
                             PEAK FLOW RATE(CFS) = 287.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21313.00 TO NODE 21360.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1255.00
 FLOW LENGTH (FEET) = 1079.23 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 2.28 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 21.03
 BOX-FLOW(CFS) = 287.46
 BOX-FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 22.76
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 22.76
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.717
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                           4.55
                                     0.75
                                           0.600
                                                   56
 MOBILE HOME PARK
                           1.01
                                     0.75
                                            0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.536
 SUBAREA AREA (ACRES) = 5.56
                            SUBAREA RUNOFF (CFS) = 6.59
 EFFECTIVE AREA(ACRES) = 251.91 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) =
                  251.9
                              PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

File name: LR0213ZZ.RES

Page 12

Date: 04/21/2014

\*

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 21320.00 TO NODE 21321.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.31
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.841
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.680
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fp
                                           Ap SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
                          7.00
 "3-4 DWELLINGS/ACRE"
                  В
                                 0.75
                                          0.600
                                                56 10.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 14.06
 TOTAL AREA (ACRES) = 7.00 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21321.00 TO NODE 21322.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1450.00 DOWNSTREAM(FEET) = 1420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 725.48 CHANNEL SLOPE = 0.0414
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 14.06
 FLOW VELOCITY (FEET/SEC.) = 2.15 FLOW DEPTH (FEET) = 0.36
 TRAVEL TIME (MIN.) = 5.62 Tc (MIN.) = 16.46
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21322.00 = 1636.79 FEET.
*****************
 FLOW PROCESS FROM NODE 21322.00 TO NODE 21322.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.46
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.086
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                SCS
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                              9.15
                                      0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.15
                             SUBAREA RUNOFF (CFS) = 13.48
 EFFECTIVE AREA(ACRES) = 16.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 16.1
                              PEAK FLOW RATE(CFS) =
                                                    23.80
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*****************
 FLOW PROCESS FROM NODE 21322.00 TO NODE 21332.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1420.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
 FLOW LENGTH (FEET) = 1402.23 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 9.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.03
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 18.01
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
*****************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 18.01
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.976
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                    SCS
    LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.34 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.34
                             SUBAREA RUNOFF (CFS) = 12.84
 EFFECTIVE AREA(ACRES) = 25.49 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                   25.5
                               PEAK FLOW RATE(CFS) =
                                                    35.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
```

File name: LR0213ZZ.RES

Page 14

Date: 04/21/2014

```
TOTAL NUMBER OF STREAMS = 2
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TIME OF CONCENTRATION (MIN.) = 18.01
                                                                              SUBAREA AREA(ACRES) = 22.89 SUBAREA RUNOFF(CFS) = 35.28
                                                                              EFFECTIVE AREA(ACRES) = 32.56 AREA-AVERAGED Fm(INCH/HR) = 0.45
 RAINFALL INTENSITY (INCH/HR) = 1.98
 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                              TOTAL AREA (ACRES) = 32.6 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 25.49
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 TOTAL STREAM AREA(ACRES) = 25.49
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                35.04
                                                                              STREET CROSS-SECTION INFORMATION:
*******************
                                                                              CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21330.00 TO NODE 21331.00 IS CODE = 21
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
______
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 870.87
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1425.00
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                              STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.920
                                                                              STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 34.01
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.307
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                                STREET FLOW DEPTH (FEET) = 0.46
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                              Ap SCS Tc
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 16.63
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.90
 RESIDENTIAL
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.71
 "3-4 DWELLINGS/ACRE" B 9.67 0.75 0.600 56 13.92
                                                                              LONGEST FLOWPATH FROM NODE 21330.00 TO NODE 21332.00 = 2157.22 FEET.
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 16.17
                                                                              FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
 TOTAL AREA (ACRES) = 9.67 PEAK FLOW RATE (CFS) = 16.17
                                                                              >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
                                                                             ______
                                                                              TOTAL NUMBER OF STREAMS = 2
*********************
                                                                              CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 21331.00 TO NODE 21332.00 IS CODE = 33
                                                                              TIME OF CONCENTRATION (MIN.) = 15.52
______
                                                                              RAINFALL INTENSITY (INCH/HR) = 2.16
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                              AREA-AVERAGED Fm(INCH/HR) = 0.45
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                              AREA-AVERAGED Fp (INCH/HR) = 0.75
______
                                                                              AREA-AVERAGED Ap = 0.60
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
                                                                              EFFECTIVE STREAM AREA(ACRES) = 32.56
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
                                                                              TOTAL STREAM AREA(ACRES) = 32.56
 FLOW LENGTH (FEET) = 1286.35 MANNING'S N = 0.013
                                                                              PEAK FLOW RATE (CFS) AT CONFLUENCE = 50.18
                                                                              ** CONFLUENCE DATA **
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 7.8 INCHES
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                               NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.23
 PIPE-FLOW(CFS) = 16.17
                                                                               1
                                                                                        35.04 18.01 1.976 0.75(0.45) 0.60 25.5 21320.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                        50.18 15.52 2.161 0.75(0.45) 0.60 32.6 21330.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 15.52
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.161
                                                                              RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              CONFLUENCE FORMULA USED FOR 2 STREAMS.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                               αA
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              ** PEAK FLOW RATE TABLE **
 RESIDENTIAL
                                                                               STREAM Q To Intensity Fp(Fm) Ap Ae
 "3-4 DWELLINGS/ACRE" B
                              22.89
                                       0.75 0.600 56
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR)
       Date: 04/21/2014
                     File name: LR0213ZZ.RES
                                                    Page 15
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 16

50.18

HEADWATER

HEADWATER

NODE

(ACRES)

```
84.02 15.52 2.161 0.75(0.45) 0.60
                                         54.5 21330.00
    1
          79.79 18.01 1.976 0.75(0.45) 0.60
                                         58.0 21320.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 84.02 Tc (MIN.) = 15.52
 EFFECTIVE AREA(ACRES) = 54.51 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                 58.0
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21355.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1355.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 766.86 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 20.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.78
 PIPE-FLOW(CFS) =
               84.02
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 16.16
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET.
*****************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.16
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.109
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.76 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 14.76 SUBAREA RUNOFF(CFS) = 22.05
 EFFECTIVE AREA(ACRES) = 69.27 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 72.8 PEAK FLOW RATE (CFS) = 103.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21340.00 TO NODE 21341.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 528.12
 ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1530.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.378
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.376
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56
                                       0.75
                                               0.600
                                                      56
                                                          7.38
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                             3.79 0.75 0.700 56 7.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA RUNOFF(CFS) = 11.21
 TOTAL AREA (ACRES) = 4.35 PEAK FLOW RATE (CFS) = 11.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
********************
 FLOW PROCESS FROM NODE 21341.00 TO NODE 21342.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1490.00
 STREET LENGTH (FEET) = 644.80 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 28.77
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.43
  HALFSTREET FLOOD WIDTH (FEET) = 15.23
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.90
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.54
 STREET FLOW TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 9.20
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.958
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                      SCS
                                                αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              10.28
                                       0.75
                                               0.600
```

File name: LR0213ZZ.RES

Page 18

Date: 04/21/2014

```
RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 5.38 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA (ACRES) = 15.66 SUBAREA RUNOFF (CFS) = 35.00
 EFFECTIVE AREA(ACRES) = 20.01 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) = 20.0
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 6.61 DEPTH*VELOCITY (FT*FT/SEC.) = 3.22
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21342.00 = 1172.92 FEET.
FLOW PROCESS FROM NODE 21342.00 TO NODE 21343.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1425.00
 STREET LENGTH (FEET) = 1308.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.63
 STREET FLOW TRAVEL TIME (MIN.) = 2.81 Tc (MIN.) = 12.01
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.521
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.19
                                        0.75
                                                0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 33.88
                                        0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA (ACRES) = 46.07 SUBAREA RUNOFF (CFS) = 83.62
 EFFECTIVE AREA(ACRES) = 66.08 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.82
 FLOW VELOCITY (FEET/SEC.) = 8.55 DEPTH*VELOCITY (FT*FT/SEC.) = 5.61
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1308.0 FT WITH ELEVATION-DROP = 65.0 FT, IS 77.6 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21343.00
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21343.00 = 2480.92 FEET.
******************
 FLOW PROCESS FROM NODE 21343.00 TO NODE 21354.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 1461.18 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 24.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.82
 PIPE-FLOW(CFS) = 120.32
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 13.24
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
**********************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 13.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.377
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 23.13 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 23.13 SUBAREA RUNOFF(CFS) = 40.15
 EFFECTIVE AREA(ACRES) = 89.21 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 TOTAL AREA(ACRES) = 89.2
                              PEAK FLOW RATE(CFS) =
                                                  151.95
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 20

TOTAL AREA (ACRES) = 66.1 PEAK FLOW RATE (CFS) = 120.32

```
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.24
 RAINFALL INTENSITY (INCH/HR) = 2.38
 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.65
 EFFECTIVE STREAM AREA(ACRES) = 89.21
 TOTAL STREAM AREA(ACRES) = 89.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 151.95
*****************
 FLOW PROCESS FROM NODE 21350.00 TO NODE 21351.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 820.03
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1510.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.778
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.689
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Ap SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B
                          4.46
                                    0.75
                                          0.700
                                                56 11.46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  B 0.41
                                   0.75
                                          0.600
                                                56 10.78
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA RUNOFF(CFS) = 9.52
 TOTAL AREA (ACRES) = 4.87 PEAK FLOW RATE (CFS) = 9.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*******************
 FLOW PROCESS FROM NODE 21351.00 TO NODE 21352.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1480.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.29 CHANNEL SLOPE = 0.1270
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             9.52
 FLOW VELOCITY (FEET/SEC.) = 2.94 FLOW DEPTH (FEET) = 0.25
 TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 12.12
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.00 = 1056.32 FEET.
******************
 FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
```

```
MAINLINE Tc(MIN.) = 12.12
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.507
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
                                                  SCS
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.96
                                    0.75
                                           0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.22 0.75
                                           0.600
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                           SUBAREA RUNOFF(CFS) = 3.91
 SUBAREA AREA(ACRES) = 2.18
 EFFECTIVE AREA(ACRES) = 7.05 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 7.1 PEAK FLOW RATE (CFS) =
                                                  12.62
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.50 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1480.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 FLOW LENGTH (FEET) = 207.56 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 5.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.74
 PIPE-FLOW(CFS) = 12.62
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.22 Tc (MIN.) = 12.34
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.50 = 1263.88 FEET.
******************
 FLOW PROCESS FROM NODE 21352.50 TO NODE 21352.50 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 12.34
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.480
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
   LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89
                                    0.75 0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.98
                                    0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689
 SUBAREA AREA (ACRES) = 7.87 SUBAREA RUNOFF (CFS) = 13.91
 EFFECTIVE AREA(ACRES) = 14.92 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 14.9
                             PEAK FLOW RATE(CFS) =
                                                  26.37
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 21 Date: 04/21/2014 File name: LR0213ZZ.RES Page 22

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
FLOW PROCESS FROM NODE 21352.50 TO NODE 21353.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1460.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1450.00
 FLOW LENGTH (FEET) = 277.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 10.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.85
 PIPE-FLOW(CFS) = 26.37
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.33 Tc (MIN.) = 12.67
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21353.00 = 1540.88 FEET.
*******************
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21353.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 12.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.440
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          αA
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.59
                                     0.75
                                            0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 7.66
                                    0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 9.25 SUBAREA RUNOFF(CFS) = 16.06
 EFFECTIVE AREA(ACRES) = 24.17 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 24.2 PEAK FLOW RATE (CFS) = 41.90
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
********************
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21354.00 IS CODE = 42
......
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1450.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 2039.85 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 13.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.54
```

PIPE-FLOW(CFS) = 41 90 \*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 2.19 Tc (MIN.) = 14.86LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21354.00 = 3580.73 FEET. FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81 \_\_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_\_ MAINLINE Tc (MIN.) = 14.86\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.218 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Ар SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" B 33.72 0.75 0.600 56 В 0.32 0.75 0.100 56 COMMERCIAL RESIDENTIAL "2 DWELLINGS/ACRE" B 1.48 0.75 0.700 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA AREA (ACRES) = 35.52 SUBAREA RUNOFF (CFS) = 56.56 EFFECTIVE AREA(ACRES) = 59.69 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64TOTAL AREA (ACRES) = 59.7 PEAK FLOW RATE (CFS) = 93.63 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1 \_\_\_\_\_\_ >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES< \_\_\_\_\_ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 14.86 RAINFALL INTENSITY (INCH/HR) = 2.22AREA-AVERAGED Fm(INCH/HR) = 0.48AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64EFFECTIVE STREAM AREA(ACRES) = 59.69 TOTAL STREAM AREA(ACRES) = 59.69 PEAK FLOW RATE (CFS) AT CONFLUENCE = 93.63 \*\* CONFLUENCE DATA \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 151.95 13.24 2.377 0.75 (0.48) 0.65 89.2 21340.00 93.63 14.86 2.218 0.75(0.48) 0.64 59.7 21350.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) HEADWATER Date: 04/21/2014 Page 24 File name: LR021377.RFS

```
(CFS) (MIN.) (INCH/HR) (INCH/HR)
  NUMBER
                                        (ACRES)
                                                   NODE
   1
         242.98 13.24 2.377 0.75(0.48) 0.64 142.4 21340.00
         232.77 14.86 2.218 0.75(0.48) 0.64 148.9 21350.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 242.98 Tc (MIN.) = 13.24
 EFFECTIVE AREA(ACRES) = 142.37 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) =
                 148.9
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21355.00 IS CODE = 42
............
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 1308.82 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 30.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 26.52
 PIPE-FLOW(CFS) = 242.98
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 14.06
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET.
*****************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 14.06
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.293
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                 SCS
                                        αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          6.86
                                    0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                            SUBAREA RUNOFF(CFS) = 11.39
 SUBAREA AREA(ACRES) = 6.86
 EFFECTIVE AREA(ACRES) = 149.23 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA(ACRES) = 155.8 PEAK FLOW RATE(CFS) =
                                                 243.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 25

LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET. \*\* MEMORY BANK # 2 CONFLUENCE DATA \*\* Ap Ae STREAM 0 Tc Intensity Fp(Fm) HEADWATER (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 103.30 16.20 2.106 0.75 (0.45) 0.60 69.3 21330.00 1 1.932 0.75(0.45) 0.60 72.8 21320.00 97.16 18.71 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET. \*\* PEAK FLOW RATE TABLE \*\* STREAM 0 Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 342.83 14.11 2.288 0.75(0.47) 0.63 209.6 21340.00 335.68 15.74 2.142 0.75(0.47) 0.63 223.1 21350.00 331.26 16.20 2.106 0.75(0.47) 0.63 225.0 21330.00 300.72 18.71 1.932 0.75(0.47) 0.63 228.6 21320.00 TOTAL AREA (ACRES) = 228.6 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE(CFS) = 342.83 Tc(MIN.) = 14.111EFFECTIVE AREA(ACRES) = 209.56 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63TOTAL AREA (ACRES) = 228.6 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET. FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 2 <<<< \_\_\_\_\_ FLOW PROCESS FROM NODE 21355.00 TO NODE 21356.00 IS CODE = 42 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << UPSTREAM NODE ELEVATION (FEET) = 1325.00 DOWNSTREAM NODE ELEVATION (FEET) = 1315.00 FLOW LENGTH (FEET) = 763.37 MANNING'S N = 0.013USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 75.0 INCH PIPE IS 43.4 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 18.65 PIPE-FLOW(CFS) = 342.83\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 14.79 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21356.00 = 6014.29 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21356.00 TO NODE 21356.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>

Date: 04/21/2014 File name: LR0213ZZ.RES

Tc Intensity Fp(Fm)

242.98 14.11 2.288 0.75(0.48)0.64 149.2 21340.00

(CFS) (MIN.) (INCH/HR) (INCH/HR)

0

233.09 15.74

NUMBER

Ap Ae

2.142 0.75 ( 0.48) 0.64 155.8 21350.00

HEADWATER

(ACRES) NODE

Page 26

```
MAINLINE Tc(MIN.) = 14.79
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.224
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            Ар
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           4.42 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 4.42
                             SUBAREA RUNOFF (CFS) = 7.06
 EFFECTIVE AREA(ACRES) = 213.98 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 233.0
                             PEAK FLOW RATE (CFS) = 342.83
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*******************
 FLOW PROCESS FROM NODE 21356.00 TO NODE 21357.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1315.00 DOWNSTREAM(FEET) = 1296.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 552.93 CHANNEL SLOPE = 0.0344
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 342.83
 FLOW VELOCITY (FEET/SEC.) = 11.01 FLOW DEPTH (FEET) = 2.42
 TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 15.63
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21357.00 = 6567.22 FEET.
 ** PEAK FLOW RATE TABLE **
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          342.83 15.67 2.148 0.75(0.47) 0.63 214.0 21340.00
         335.68 17.32 2.023 0.75(0.47) 0.63 227.5 21350.00
          331.26 17.78 1.991 0.75(0.47) 0.63
                                             229.5 21330.00
          300.72 20.33 1.838 0.75(0.47) 0.63
                                              233.0 21320.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 342.83 Tc (MIN.) = 15.67
 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.63 EFFECTIVE AREA(ACRES) = 213.98
*******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21357.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 15.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.148
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                          Ар
                                                    SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 38.32
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 38.32
                             SUBAREA RUNOFF (CFS) = 58.60
 EFFECTIVE AREA(ACRES) = 252.30 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 271.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21358.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1296.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.89 CHANNEL SLOPE = 0.0215
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               381.69
 FLOW VELOCITY (FEET/SEC.) = 9.56 FLOW DEPTH (FEET) = 2.89
 TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 16.57
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21358.00 = 7079.11 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm)
                                        Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
          381.69 16.57 2.078 0.75 (0.47) 0.62 252.3 21340.00
          372.37 18.22 1.963 0.75(0.47) 0.62
                                               265.8 21350.00
          367.46 18.69 1.933 0.75(0.47) 0.62
                                               267.8 21330.00
          334.87 21.25 1.789 0.75(0.47) 0.62 271.3 21320.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 381.69 Tc (MIN.) = 16.57
 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.62 EFFECTIVE AREA(ACRES) =
********************
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21358.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.57
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.078
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Ap
                                                    SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 7.40
                             SUBAREA RUNOFF (CFS) = 10.85
 EFFECTIVE AREA(ACRES) = 259.70 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 278.7 PEAK FLOW RATE (CFS) =
                                                    381.69
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
```

File name: LR0213ZZ.RES

Page 28

Date: 04/21/2014

```
************************
                                                                          DOWNSTREAM NODE ELEVATION (FEET) = 1255.00
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21359.00 IS CODE = 54
                                                                          FLOW LENGTH (FEET) = 711.66 MANNING'S N = 0.013
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          USER SPECIFIED PIPE DIAMETER (INCH) = 78.00 NUMBER OF PIPES = 1
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                          DEPTH OF FLOW IN 78.0 INCH PIPE IS 41.8 INCHES
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 21.10
 ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1267.00
                                                                          PIPE-FLOW(CFS) = 381.69
 CHANNEL LENGTH THRU SUBAREA (FEET) = 575.39 CHANNEL SLOPE = 0.0313
                                                                          *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 18.00
                                                                          LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET.
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             381.69
                                                                        ******************
 FLOW VELOCITY (FEET/SEC.) = 10.96 FLOW DEPTH (FEET) = 2.63
 TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 17.44
                                                                          FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21359.00 = 7654.50 FEET.
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 ** PEAK FLOW RATE TABLE **
                                                                        Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                          MAINLINE Tc(MIN.) = 18.00
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.977
         381.69 17.44 2.015 0.75(0.47) 0.62 259.7 21340.00
    1
                                                                          SUBAREA LOSS RATE DATA (AMC II):
         372.37 19.10 1.908 0.75(0.47) 0.62
                                            273.2 21350.00
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                           Fp Ap
         367.46 19.57 1.880 0.75(0.47) 0.62 275.2 21330.00
                                                                           LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         RESIDENTIAL
         334.87 22.16 1.745 0.75(0.47) 0.62
                                           278.7 21320.00
                                                                          "3-4 DWELLINGS/ACRE" B 3.67 0.75 0.600
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 381.69 Tc (MIN.) = 17.44
                                                                          MOBILE HOME PARK
                                                                                            B 0.92 0.75 0.250
                                                                                                    0.01 0.75
 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                          COMMERCIAL
                                                                                             В
 AREA-AVERAGED Ap = 0.62 EFFECTIVE AREA(ACRES) = 259.70
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.529
*******************
                                                                          SUBAREA AREA(ACRES) = 4.60
                                                                                                   SUBAREA RUNOFF (CFS) = 6.55
 FLOW PROCESS FROM NODE 21359.00 TO NODE 21359.00 IS CODE = 81
                                                                          EFFECTIVE AREA(ACRES) = 271.41 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          TOTAL AREA(ACRES) = 290.4
                                                                                                       PEAK FLOW RATE (CFS) = 381.69
______
                                                                          NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 MAINLINE Tc (MIN.) = 17.44
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.015
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA(AMC II):
                                                                          5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                        *******************
 RESIDENTIAL
                                                                          FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 11
 "3-4 DWELLINGS/ACRE" B
                           4.95
                                     0.75
                                            0.600 56
                                                                        ______
          В
                           2.16
                                     0.75
                                                                         >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448
                            SUBAREA RUNOFF(CFS) = 10.75
 SUBAREA AREA(ACRES) = 7.11
                                                                          ** MAIN STREAM CONFLUENCE DATA **
 EFFECTIVE AREA(ACRES) = 266.81 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                          STREAM
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
                                                                          NUMBER
                                                                                  (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 TOTAL AREA (ACRES) = 285.8 PEAK FLOW RATE (CFS) = 381.69
                                                                                  381.69 18.04 1.974 0.75 (0.46) 0.62 271.4 21340.00
                                                                                  372.37 19.70 1.873 0.75(0.46) 0.62 284.9 21350.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                  367.46 20.17 1.846 0.75 (0.46) 0.62 286.9 21330.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   334.87 22.78
                                                                                               1.717 0.75(0.46) 0.62 290.4 21320.00
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
                                                                          LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET.
*****************
                                                                          ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                                 Q TC Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 FLOW PROCESS FROM NODE 21359.00 TO NODE 21360.00 IS CODE = 42
                                                                           STREAM
                                                                          NUMBER
                                                                                   287.46 22.76 1.717 0.75 (0.46) 0.61 251.9 21300.00
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                          LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
```

Date: 04/21/2014 File name: LR0213ZZ.RES Date: 04/21/2014 File name: LR0213ZZ.RES Page 29 Page 30

UPSTREAM NODE ELEVATION (FEET) = 1267.00

SCS

0.100

** PEAK FLOW RATE TABLE ** STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER	SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
1 656.09 18.04 1.974 0.75 (0.46) 0.62 471.1 21340.00	RESIDENTIAL
2 651.92 19.70 1.873 0.75 ( 0.46) 0.62 502.9 21350.00	"3-4 DWELLINGS/ACRE" B 11.84 0.75 0.600 56
3 648.36 20.17 1.846 0.75 (0.46) 0.62 510.2 21330.00	MOBILE HOME PARK B 3.43 0.75 0.250 56
4 622.54 22.76 1.717 0.75 (0.46) 0.62 542.3 21300.00	COMMERCIAL B 1.54 0.75 0.100 56
5 622.15 22.78 1.717 0.75 ( 0.46) 0.62 542.3 21320.00	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
TOTAL AREA (ACRES) = 542.3	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.483
TOTHE INCHES	SUBAREA AREA (ACRES) = 16.81 SUBAREA RUNOFF (CFS) = 23.25
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:	EFFECTIVE AREA (ACRES) = 487.89 AREA-AVERAGED Fm(INCH/HR) = 0.46
PEAK FLOW RATE(CFS) = 656.09 Tc(MIN.) = 18.040	AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
EFFECTIVE AREA (ACRES) = 471.08 AREA-AVERAGED Fm (INCH/HR) = 0.46	TOTAL AREA (ACRES) = 559.1 PEAK FLOW RATE (CFS) = 656.09
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62	NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
	NOIE: PEAR FLOW RAIE DEFAULTED TO OPSIREAM VALUE
TOTAL AREA (ACRES) = 542.3	CURRENT AND AMERICAN DATABASE PROPERTY (TANGET)
LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
*************	5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
	****************
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 12	
	FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 10
>>>>CLEAR MEMORY BANK # 1 <<<<<	>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
	////MAIN-SIREAM MEMORI COFIED UNIO MEMORI DANK # 1 VVVV
*****************	
FLOW PROCESS FROM NODE 21360.00 TO NODE 21361.00 IS CODE = 54	*****************
	FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 15.1
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<	
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<	>>>> DEFINE MEMORY BANK # 2 <<<<
ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1240.00	PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
CHANNEL LENGTH THRU SUBAREA (FEET) = 770.40 CHANNEL SLOPE = 0.0195	MEMORY BANK # 2 DEFINED AS FOLLOWS:
CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000	PEAK FLOW RATE (CFS) = 1253.07 Tc (MIN.) = 31.77
MANNING'S FACTOR = 0.035 MAXIMUM DEPTH(FEET) = 6.00	AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.54
CHANNEL FLOW THRU SUBAREA(CFS) = 656.09	TOTAL AREA (ACRES) = 1340.4
FLOW VELOCITY (FEET/SEC.) = 10.42 FLOW DEPTH (FEET) = 3.36	LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 19.27	ECNOBER FEORE AND ELECTION TO HOLE 21240.00 13373.70 FEBT.
LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21361.00 = 11092.76 FEET.	*******************
HONGEST FROM NODE 21300.00 TO NODE 21301.00 - 11092.70 FEET.	FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 14.0
** PEAK FLOW RATE TABLE **	FLOW FROCESS FROM NODE Z1240.00 10 NODE Z1240.00 13 CODE - 14.0
	>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY
~	>>>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY
· · · · · · · · · · · · · · · · · · ·	MAIN CEDEAM MEMORY DESTREE AC SOLITONS.
2 651.92 20.93 1.806 0.75 (0.46) 0.62 502.9 21350.00	MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
3 648.36 21.41 1.781 0.75 (0.46) 0.62 510.2 21330.00	PEAK FLOW RATE (CFS) = 1253.07 Tc (MIN.) = 31.77
4 622.54 24.01 1.663 0.75(0.46) 0.62 542.3 21300.00	AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.54
5 622.15 24.03 1.662 0.75(0.46) 0.62 542.3 21320.00	TOTAL AREA(ACRES) = 1340.4
NEW PEAK FLOW DATA ARE:	LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
PEAK FLOW RATE(CFS) = 656.09 Tc(MIN.) = 19.27	
AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.75	******************
AREA-AVERAGED Ap = 0.62 EFFECTIVE AREA(ACRES) = 471.08	FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 12
***************	>>>>CLEAR MEMORY BANK # 2 <<<<
FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 81	
ANNA ADDITION OF GUDADES TO MAINTINE DESK FLOW.	************
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>	
	FLOW PROCESS FROM NODE 21248.00 TO NODE 21361.00 IS CODE = 54
MAINLINE TC(MIN.) = 19.27  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.898	
	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

Date: 04/21/2014 File name: LR0213ZZ.RES Page 31

Date: 04/21/2014

File name: LR0213ZZ.RES

Page 32

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET. \*\* MEMORY BANK # 1 CONFLUENCE DATA \*\* 0 Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 656.09 19.27 1.898 0.75(0.46) 0.61 487.9 21340.00 519.7 21350.00 651.92 20.93 1.806 0.75(0.46) 0.61 648.36 21.41 1.781 0.75 ( 0.46) 0.61 527.0 21330.00 622.54 24.01 1.663 0.75(0.46) 0.61 559.1 21300.00 622.15 24.03 1.662 0.75(0.46)0.61 559.1 21320.00 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21361.00 = 11092.76 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.56;6H= 2.11;24H= 4.21 S-GRAPH: VALLEY (DEV.) = 96.0%; VALLEY (UNDEV.) / DESERT= 4.0% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.45; Ybar = 0.53 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91; 3HR = 0.99; 6HR = 0.99; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2001.2 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0320; Lca/L=0.4, n=.0287; Lca/L=0.5, n=.0264; Lca/L=0.6, n=.0246 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 352.50 PEAK FLOW RATE (CFS) = 1783.37\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<<< \_\_\_\_\_ FLOW PROCESS FROM NODE 21361.00 TO NODE 21378.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 1235.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 988.61 CHANNEL SLOPE = 0.0051 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50 CHANNEL FLOW THRU SUBAREA(CFS) = 1783.37 FLOW VELOCITY (FEET/SEC.) = 15.47 FLOW DEPTH (FEET) = 5.01 TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 33.79LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81 \_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_\_ MAINLINE Tc(MIN.) = 33.79\* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.355 SUBAREA LOSS RATE DATA (AMC II):

File name: LR021377.RFS

Page 34

Date: 04/21/2014

```
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                        Fρ
                                                 Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349
     LAND USE
 RESIDENTIAL
                                                                                 SUBAREA RUNOFF (CFS) = 20.04
                                                                                 TOTAL AREA(ACRES) = 7.30 PEAK FLOW RATE(CFS) = 20.04
 "3-4 DWELLINGS/ACRE" B
                              4.75
                                      0.75 0.600 56
                       В 11.57
                                        0.75
                                                0.100 56
 COMMERCIAL
 MOBILE HOME PARK
                      В 12.66
                                      0.75
                                                0.250 56
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.247
                                                                                ******************
 SUBAREA AREA(ACRES) = 28.98
 UNIT-HYDROGRAPH DATA:
                                                                                 FLOW PROCESS FROM NODE 21371.00 TO NODE 21372.00 IS CODE = 63
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.56;6H= 2.11;24H= 4.20
 S-GRAPH: VALLEY(DEV.) = 96.1%; VALLEY(UNDEV.) / DESERT = 3.9%
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.45; Ybar = 0.53
                                                                                _______
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                 UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1380.00
 DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;
                                                                                 STREET LENGTH (FEET) = 602.50 CURB HEIGHT (INCHES) = 6.0
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2030.2
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  Lca/L=0.3,n=.0314; Lca/L=0.4,n=.0282; Lca/L=0.5,n=.0259; Lca/L=0.6,n=.0241
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 359.85
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1774.77
 TOTAL AREA (ACRES) = 2030.2 PEAK FLOW RATE (CFS) = 1783.37
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
******************
                                                                                   ***STREET FLOWING FULL***
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW DEPTH (FEET) = 0.50
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 18.13
_____
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.60
 TOTAL NUMBER OF STREAMS = 2
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.81
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 2.79 Tc (MIN.) = 10.41
                                                                                 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.745
 PEAK FLOW RATE (CFS) = 1783.37 Tc (MIN.) = 33.79
 AREA-AVERAGED Fm(INCH/HR) = 0.45 Ybar = 0.53
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 TOTAL AREA(ACRES) = 2030.2
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
******************
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 5.99 0.75 0.600
                                                                                                                                         56
 FLOW PROCESS FROM NODE 21370.00 TO NODE 21371.00 IS CODE = 21
                                                                                                              0.01 0.75 0.100
                                                                                 COMMERCIAL
                                                                                                       В
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.599
                                                                                 SUBAREA AREA (ACRES) = 6.00 SUBAREA RUNOFF (CFS) = 12.40
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 627.80
                                                                                 EFFECTIVE AREA(ACRES) = 13.30 AREA-AVERAGED Fm(INCH/HR) = 0.35
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1390.00
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
                                                                                 TOTAL AREA (ACRES) = 13.3 PEAK FLOW RATE (CFS) =
                                                                                                                                          28.73
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.620
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.311
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Ар
                                                       SCS Tc
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                     Fρ
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.68
 RESIDENTIAL
                                                                                 FLOW VELOCITY (FEET/SEC.) = 3.72 DEPTH*VELOCITY (FT*FT/SEC.) = 1.91
 "3-4 DWELLINGS/ACRE"
                     В
                                3.63
                                         0.75
                                                0.600
                                                      56 10.33
                                                                                 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21372.00 = 1230.30 FEET.
 COMMERCIAL
                        В
                                3.67
                                         0.75
                                                0.100 56 7.62
```

Page 35

Date: 04/21/2014 File name: LR0213ZZ.RES

```
******************
 FLOW PROCESS FROM NODE 21372.00 TO NODE 21373.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1365.00
 FLOW LENGTH (FEET) = 527.76 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.30
 PIPE-FLOW(CFS) = 28.73
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 11.11
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.640
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.16 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.16 SUBAREA RUNOFF (CFS) = 10.18
 EFFECTIVE AREA(ACRES) = 18.46 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 18.5 PEAK FLOW RATE (CFS) =
                                                         37.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                            STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 8.92
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.35
   HALFSTREET FLOOD WIDTH (FEET) = 11.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.15
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21373.00 = 1758.06 FEET.
FLOW PROCESS FROM NODE 21373.00 TO NODE 21374.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1365.00
```

```
DOWNSTREAM NODE ELEVATION (FEET) = 1345.00
 FLOW LENGTH (FEET) = 326.48 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 11.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.92
 PIPE-FLOW(CFS) =
                    37.65
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 11.42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.598
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.94
                                         0.75 0.600
                      B 0.17 0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
 SUBAREA AREA (ACRES) = 5.11 SUBAREA RUNOFF (CFS) = 9.94
 EFFECTIVE AREA(ACRES) = 23.57 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.52
 TOTAL AREA (ACRES) = 23.6 PEAK FLOW RATE (CFS) =
                                                      46.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 9.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.32
   HALFSTREET FLOOD WIDTH (FEET) = 9.52
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.43
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21374.00 = 2084.54 FEET.
*******************
 FLOW PROCESS FROM NODE 21374.00 TO NODE 21375.00 IS CODE = 42
 ._____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1345.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1330.00
 FLOW LENGTH (FEET) = 319.60 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 14.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.26
```

File name: LR0213ZZ.RES

Page 38

Date: 04/21/2014

```
PIPE-FLOW(CFS) =
                46.88
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.29 Tc (MIN.) = 11.71
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21375.00 = 2404.14 FEET.
FLOW PROCESS FROM NODE 21375.00 TO NODE 21375.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.71
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.559
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                          Aр
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  в 10.88
                                   0.75
                                          0.600
                                               56
                   B 14.84
                                   0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.312
 SUBAREA AREA(ACRES) = 25.72
                         SUBAREA RUNOFF(CFS) = 53.83
 EFFECTIVE AREA(ACRES) = 49.29 AREA-AVERAGED Fm(INCH/HR) = 0.31
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.41
 TOTAL AREA (ACRES) = 49.3 PEAK FLOW RATE (CFS) = 99.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21375.00 TO NODE 21376.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1330.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1275.00
 FLOW LENGTH (FEET) = 1914.40 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 23.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.42
 PIPE-FLOW(CFS) = 99.88
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.73 Tc(MIN.) = 13.44
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21376.00 = 4318.54 FEET.
******************
 FLOW PROCESS FROM NODE 21376.00 TO NODE 21376.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 13.44
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.355
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                SCS
                                           αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           33.59
                                   0.75
                                          0.600 56
```

```
B 3.65 0.75 0.250
 MOBILE HOME PARK
                                                    56
                      В
                             1.26
                                      0.75 0.100
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.550
 SUBAREA AREA (ACRES) = 38.50 SUBAREA RUNOFF (CFS) = 67.35
 EFFECTIVE AREA(ACRES) = 87.79 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) =
                  87.8
                               PEAK FLOW RATE(CFS) =
                                                   158.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
******************
 FLOW PROCESS FROM NODE 21376.00 TO NODE 21377.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1275.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1257.00
 FLOW LENGTH (FEET) = 629.69 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 28.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.59
 PIPE-FLOW(CFS) = 158.21
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 13.95
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21377.00 = 4948.23 FEET.
******************
 FLOW PROCESS FROM NODE 21377.00 TO NODE 21377.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 13.95
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.303
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                             αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     B 12.70 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.69 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344
 SUBAREA AREA(ACRES) = 17.39
                            SUBAREA RUNOFF (CFS) = 32.02
 EFFECTIVE AREA(ACRES) = 105.18 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) =
                   105.2
                              PEAK FLOW RATE(CFS) =
                                                   186.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*****************
 FLOW PROCESS FROM NODE 21377.00 TO NODE 21378.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

File name: LR021377.RFS

Page 40

Date: 04/21/2014

```
_____
 UPSTREAM NODE ELEVATION (FEET) = 1257.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1235.00
 FLOW LENGTH (FEET) = 1320.25 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 33.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.52
 PIPE-FLOW(CFS) = 186.12
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 15.21
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21378.00 = 6268.48 FEET.
*****************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 15.21
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                                SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                   B 17.63 0.75 0.250 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.262
 SUBAREA AREA(ACRES) = 18.28
                         SUBAREA RUNOFF (CFS) = 32.75
 EFFECTIVE AREA(ACRES) = 123.46 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
 TOTAL AREA (ACRES) = 123.5
                           PEAK FLOW RATE(CFS) =
                                                207.89
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00
*******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.21
 RAINFALL INTENSITY (INCH/HR) = 2.19
 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.42
 EFFECTIVE STREAM AREA(ACRES) = 123.46
 TOTAL STREAM AREA(ACRES) = 123.46
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 207.89
 ** CONFLUENCE DATA **
 STREAM O
               Tc AREA
                              HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                               NODE
   1 1783.37 33.79 2030.17 21100.00
        207.89 15.21 123.46 21370.00
```

File name: LR0213ZZ.RES

Page 41

Date: 04/21/2014

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.56;6H= 2.10;24H= 4.19
 S-GRAPH: VALLEY(DEV.) = 96.3%; VALLEY(UNDEV.) / DESERT = 3.7%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.44; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0314; Lca/L=0.4,n=.0282; Lca/L=0.5,n=.0259; Lca/L=0.6,n=.0241
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 385.59
 PEAK FLOW RATE (CFS) = 1880.76
*******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 21378.DNA
END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 2153.6 TC (MIN.) =
                                      33.79
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.52
 PEAK FLOW RATE (CFS) = 1880.76
_____
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2012 Advanced Engineering Software (aes) Ver. 18.2 Release Date: 05/08/2012 License ID 1264

Analysis prepared by:

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21470

\* 25-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0214ZZ.DAT

1.5

36.0

16 12.5

20.0

5.0

TIME/DATE OF STUDY: 08:05 11/19/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 25.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9700

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 10 30.0 2.00 0.0312 0.167 0.0180 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 2.00 0.0312 0.167 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 14 39.0 20.0 0.67 2.00 0.0312 0.167 0.0180 0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020 0.50

GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21400.00 TO NODE 21401.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 598.36 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1360.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.742 \* 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.314 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" 8.19 0.75 0.600 RESIDENTIAL "2 DWELLINGS/ACRE" 0.62 0.75 0.700 COMMERCIAL В 0.44 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583 SUBAREA RUNOFF (CFS) = 23.969.25 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 23.96 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21401.00 TO NODE 21402.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1360.00 DOWNSTREAM(FEET) = 1336.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 415.44 CHANNEL SLOPE = 0.0578

Date: 04/21/2014

File name: LR021477.RFS

17 20.0

18 26.0

19 52.0

10.0

15.0

20.0

0.020/0.020/0.020

0.020/0.020/0.020 0.67

0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

SCS Tc

Page 2

56 10.49

56 11.15 7.74

0.67

File name: LR0214ZZ.RES Date: 04/21/2014 Page 1

0.67

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             23.96
 FLOW VELOCITY (FEET/SEC.) = 3.76 FLOW DEPTH (FEET) = 0.65
 TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 9.58
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21402.00 = 1013.80 FEET.
******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21402.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 9.58
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.916
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           Ар
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.47 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 3.47 SUBAREA RUNOFF (CFS) = 7.71
 EFFECTIVE AREA(ACRES) = 12.72 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 12.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21403.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1336.00 DOWNSTREAM(FEET) = 1327.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 198.50 CHANNEL SLOPE = 0.0453
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.57 FLOW DEPTH (FEET) = 0.73
 TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 10.51
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21403.00 = 1212.30 FEET.
******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21403.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 10.51
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.759
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Дp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                           3.90
 "3-4 DWELLINGS/ACRE" B
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
```

```
SUBAREA AREA(ACRES) = 3.90
                          SUBAREA RUNOFF(CFS) = 8.11
 EFFECTIVE AREA(ACRES) = 16.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA(ACRES) = 16.6
                              PEAK FLOW RATE(CFS) =
                                                   34.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
*******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21404.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1310.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 389.91 CHANNEL SLOPE = 0.0436
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.70 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 1.76 Tc (MIN.) = 12.27
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21404.00 = 1602.21 FEET.
**********************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21404.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 12.27
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.515
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           3.41 0.75 0.600
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 3.41 SUBAREA RUNOFF(CFS) = 6.34
 EFFECTIVE AREA(ACRES) = 20.03 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 20.0 PEAK FLOW RATE (CFS) =
                                                   37.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
*******************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21405.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1310.00 DOWNSTREAM(FEET) = 1295.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 295.90 CHANNEL SLOPE = 0.0507
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             37.34
 FLOW VELOCITY (FEET/SEC.) = 4.00 FLOW DEPTH (FEET) = 0.79
 TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 13.50
```

Page 4

Date: 04/21/2014 File name: LR0214ZZ.RES Page 3 Date: 04/21/2014 File name: LR0214ZZ.RES

```
LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21405.00 = 1898.11 FEET.
******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21405.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 13.50
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.374
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.54
                                             0.600 56
                                      0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 8.54
                             SUBAREA RUNOFF(CFS) = 14.80
 EFFECTIVE AREA(ACRES) = 28.57 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) =
                      28.6
                             PEAK FLOW RATE(CFS) =
                                                     49.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21406.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 314.00 CHANNEL SLOPE = 0.0318
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 20.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              49.61
 FLOW VELOCITY (FEET/SEC.) = 3.36 FLOW DEPTH (FEET) = 0.86
 TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 15.06
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21406.00 = 2212.11 FEET.
*********************
 FLOW PROCESS FROM NODE 21406.00 TO NODE 21406.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.06
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.224
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                             Aр
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             26.61
                                      0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 26.61
                             SUBAREA RUNOFF (CFS) = 42.50
 EFFECTIVE AREA(ACRES) = 55.18 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                 55.2
                             PEAK FLOW RATE(CFS) = 88.24
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
FLOW PROCESS FROM NODE 21406.00 TO NODE 21417.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1285.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
 FLOW LENGTH (FEET) = 1395.25 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.2 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 16.73
                  88.24
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 16.45
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
******************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.45
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.109
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    В
                          1.06 0.75
                                           0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.55 0.75
                                           0.600
                                                  56
                    B 12.65
                                   0.75
                                           0.250
                                                  56
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA(ACRES) = 19.26
                           SUBAREA RUNOFF(CFS) = 32.11
 EFFECTIVE AREA(ACRES) = 74.44 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 74.4 PEAK FLOW RATE (CFS) =
                                               114.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
*******************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 16.45
 RAINFALL INTENSITY (INCH/HR) = 2.11
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) =
                            74.44
```

Page 6

Date: 04/21/2014 File name: LR0214ZZ.RES Page 5 Date: 04/21/2014 File name: LR0214ZZ.RES

```
TOTAL STREAM AREA(ACRES) = 74.44
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 114.66
******************
 FLOW PROCESS FROM NODE 21410.00 TO NODE 21411.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 770.62
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1345.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.679
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.589
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            Ар
                                                 SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            3.87
                                    0.75
                                           0.600
                                                 56 11.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    в 1.17
                                    0.75
                                           0.700
                                                56 12.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.623
 SUBAREA RUNOFF (CFS) = 9.63
 TOTAL AREA (ACRES) = 5.04 PEAK FLOW RATE (CFS) = 9.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21411.00 TO NODE 21412.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1345.00 DOWNSTREAM(FEET) = 1312.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 618.61 CHANNEL SLOPE = 0.0533
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 9.63
 FLOW VELOCITY (FEET/SEC.) = 2.13 FLOW DEPTH (FEET) = 0.30
 TRAVEL TIME (MIN.) = 4.83 Tc (MIN.) = 16.51
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21412.00 = 1389.23 FEET.
*********************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21412.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.51
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.104
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                 SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  в 7.50
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 7.50
                             SUBAREA RUNOFF (CFS) = 11.17
 EFFECTIVE AREA(ACRES) = 12.54 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 12.5 PEAK FLOW RATE (CFS) =
                                                    18.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
**********************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21413.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1312.00 DOWNSTREAM(FEET) = 1300.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 262.39 CHANNEL SLOPE = 0.0457
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               18.60
 FLOW VELOCITY (FEET/SEC.) = 2.40 FLOW DEPTH (FEET) = 0.39
 TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 18.33
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21413.00 = 1651.62 FEET.
*****************
 FLOW PROCESS FROM NODE 21413.00 TO NODE 21413.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 18.33
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.976
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.80 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 1.80
                             SUBAREA RUNOFF (CFS) = 2.47
 EFFECTIVE AREA(ACRES) = 14.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA(ACRES) = 14.3
                               PEAK FLOW RATE(CFS) =
                                                     19.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21413.00 TO NODE 21414.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1300.00 DOWNSTREAM(FEET) = 1287.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.82 CHANNEL SLOPE = 0.0400
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             19.63
 FLOW VELOCITY (FEET/SEC.) = 2.28 FLOW DEPTH (FEET) = 0.41
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 8

```
TRAVEL TIME (MIN.) = 2.37 Tc (MIN.) = 20.71
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21414.00 = 1976.44 FEET.
FLOW PROCESS FROM NODE 21414.00 TO NODE 21414.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 20.71
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.837
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            5.90
                                   0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.90
                           SUBAREA RUNOFF (CFS) = 7.37
 EFFECTIVE AREA(ACRES) = 20.24 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) =
                 20.2 PEAK FLOW RATE(CFS) =
                                                 25.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
**********************
 FLOW PROCESS FROM NODE 21414.00 TO NODE 21415.00 IS CODE = 42
_____
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1287.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1277.00
 FLOW LENGTH (FEET) = 263.30 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.23
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 21.01
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21415.00 = 2239.74 FEET.
******************
 FLOW PROCESS FROM NODE 21415.00 TO NODE 21415.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 21.01
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.820
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fρ
                                         αA
                                                SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    В
                                          0.250 56
                           0.54
                                   0.75
 MOBILE HOME PARK
 PUBLIC PARK
                     В
                            1.31
                                   0.75
                                          0.850
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.69
                                 0.75
                                        0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.655
 SUBAREA AREA(ACRES) = 2.54
                              SUBAREA RUNOFF (CFS) = 3.04
 EFFECTIVE AREA(ACRES) = 22.78 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 22.8
                                                     27.95
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 4.00
**********************
 FLOW PROCESS FROM NODE 21415.00 TO NODE 21416.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1277.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1263.00
 FLOW LENGTH (FEET) = 509.70 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.04
 PIPE-FLOW(CFS) =
                   27.95
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 21.67
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21416.00 = 2749.44 FEET.
*****************
 FLOW PROCESS FROM NODE 21416.00 TO NODE 21416.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 21.67
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.787
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                              αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                     В
                            2.38
                                      0.75 0.250
 PUBLIC PARK
                       В
                              2.15
                                      0.75
                                            0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535
 SUBAREA AREA(ACRES) = 4.53
                             SUBAREA RUNOFF (CFS) = 5.66
 EFFECTIVE AREA(ACRES) = 27.31 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 27.3
                               PEAK FLOW RATE(CFS) =
                                                     32.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21416.00 TO NODE 21417.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1263.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
 FLOW LENGTH (FEET) = 417.28 MANNING'S N = 0.013
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 10

```
USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
                                                                        ** PEAK FLOW RATE TABLE **
                                                                        STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 14.20
                                                                        NUMBER
                                                                                 (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 PIPE-FLOW(CFS) = 32.93
                                                                         1
                                                                                146.53 16.45 2.109 0.75(0.41) 0.54 95.7 21400.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                         2 125.57 22.16 1.763 0.75(0.41) 0.55 103.1 21410.00
 PIPEFLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 22.16
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21417.00 = 3166.72 FEET.
                                                                        COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                        PEAK FLOW RATE (CFS) = 146.53 Tc (MIN.) = 16.45
************************
                                                                        EFFECTIVE AREA(ACRES) = 95.68 AREA-AVERAGED Fm(INCH/HR) = 0.41
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
                                                                        TOTAL AREA (ACRES) =
                                                                                         103.1
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
_____
                                                                      **********************
 MAINLINE Tc(MIN.) = 22.16
                                                                        FLOW PROCESS FROM NODE 21417.00 TO NODE 21418.00 IS CODE = 42
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.763
 SUBAREA LOSS RATE DATA (AMC II):
                                                                       ______
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                       >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                  B 0.24 0.75 0.100 56
 COMMERCIAL
                                                                      RESIDENTIAL
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1250.00
 "3-4 DWELLINGS/ACRE" B 0.73 0.75 0.600 56
                                                                        DOWNSTREAM NODE ELEVATION (FEET) = 1218.00
 MOBILE HOME PARK
                   B 0.34 0.75 0.250 56
                                                                        FLOW LENGTH (FEET) = 2374.87 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.418
                                                                        USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 SUBAREA AREA(ACRES) = 1.31 SUBAREA RUNOFF(CFS) = 1.71
                                                                        DEPTH OF FLOW IN 51.0 INCH PIPE IS 32.9 INCHES
 EFFECTIVE AREA(ACRES) = 28.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                        PIPE-FLOW VELOCITY(FEET/SEC.) = 15.15
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                       PIPE-FLOW(CFS) = 146.53
 TOTAL AREA(ACRES) = 28.6 PEAK FLOW RATE(CFS) = 34.05
                                                                        *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        PIPEFLOW TRAVEL TIME (MIN.) = 2.61 Tc (MIN.) = 19.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET.
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
                                                                      ******************
*****************
                                                                        FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
.....
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                      >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                        MAINLINE Tc(MIN.) = 19.06
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.930
 TOTAL NUMBER OF STREAMS = 2
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                Аp
                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TIME OF CONCENTRATION (MIN.) = 22.16
                                                                          LAND USE
 RAINFALL INTENSITY (INCH/HR) = 1.76
                                                                        RESIDENTIAL
 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                        "3-4 DWELLINGS/ACRE" B
                                                                                                 3.88
                                                                                                          0.75 0.600
                                                                        COMMERCIAL
                                                                                                 9.63
                                                                                                          0.75 0.100 56
 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                                           В
                                                                        MOBILE HOME PARK B
                                                                                                  29.24
                                                                                                           0.75 0.250
 AREA-AVERAGED Ap = 0.59
 EFFECTIVE STREAM AREA(ACRES) = 28.62
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL STREAM AREA(ACRES) = 28.62
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.248
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                        SUBAREA AREA (ACRES) = 42.75 SUBAREA RUNOFF (CFS) = 67.13
                                                                        EFFECTIVE AREA(ACRES) = 138.43 AREA-AVERAGED Fm(INCH/HR) = 0.34
 ** CONFLUENCE DATA **
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
        Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                        TOTAL AREA(ACRES) = 145.8
  STREAM
                                                                                                    PEAK FLOW RATE(CFS) = 198.29
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1 114.66 16.45 2.109 0.75(0.40) 0.53 74.4 21400.00
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
        34.05 22.16 1.763 0.75(0.44) 0.59 28.6 21410.00
                                                                        5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
                                                                      RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                        FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 10
```

Page 11

Date: 04/21/2014 File name: LR0214ZZ.RES

```
LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                         RESIDENTIAL
_____
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                            В
                                                                                                    7.20
                                                                         COMMERCIAL
                                                                                              В
                                                                                                    26.95
В
                                                                                                    13.18
                                                                         MOBILE HOME PARK
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 15.1
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.218
 >>>> DEFINE MEMORY BANK # 2 <<<<
                                                                         SUBAREA AREA (ACRES) = 47.33
_____
                                                                         UNIT-HYDROGRAPH DATA:
 PEAK FLOWRATE TABLE FILE NAME: 21378.DNA
                                                                         RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.56;6H= 2.10;24H= 4.18
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
                                                                         S-GRAPH: VALLEY(DEV.) = 96.4%; VALLEY(UNDEV.) / DESERT = 3.6%
                                                                                MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 PEAK FLOW RATE (CFS) = 1880.76 Tc (MIN.) = 33.79
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.52
                                                                         Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.44; Ybar = 0.52
                                                                         USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
                                                                         DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
                                                                         3HR = 0.99; 6HR = 0.99; 24HR = 1.00
******************
                                                                         UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2201.0
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 14.0
                                                                         LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
                                                                          EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
                                                                          Lca/L=0.3, n=.0304; Lca/L=0.4, n=.0273; Lca/L=0.5, n=.0251; Lca/L=0.6, n=.0234
_____
                                                                         TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 397.60
                                                                         UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1887.01
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
                                                                         TOTAL AREA (ACRES) = 2201.0 PEAK FLOW RATE (CFS) = 1887.01
 PEAK FLOW RATE (CFS) = 1880.76 Tc (MIN.) = 33.79
 AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.52
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 TOTAL AREA(ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
                                                                        ******************
*****************
                                                                         FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 11
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 12
                                                                         >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
 >>>>CLEAR MEMORY BANK # 2 <<<<<
                                                                        ______
_____
                                                                         ** MAIN STREAM CONFLUENCE DATA **
*************************
                                                                         PEAK FLOW RATE (CFS) = 1887.01 Tc (MIN.) = 34.70
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21418.00 IS CODE = 54
                                                                         AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.52
                                                                         TOTAL AREA (ACRES) = 2201.0
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         ** MEMORY BANK # 1 CONFLUENCE DATA **
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1218.00
                                                                          STREAM
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1235.33 CHANNEL SLOPE = 0.0138
                                                                          NUMBER
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
                                                                            1
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 1880.76
 FLOW VELOCITY (FEET/SEC.) = 22.56 FLOW DEPTH (FEET) = 3.98
 TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 34.70
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
                                                                         UNIT-HYDROGRAPH DATA:
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 34.70
                                                                         3HR = 0.98; 6HR = 0.99; 24HR = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.347
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                          EOUIVALENT BASIN FACTOR APPROXIMATIONS:
      Date: 04/21/2014 File name: LR021477.RFS
                                                 Page 13
```

Q Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 196.96 19.24 1.920 0.75(0.34) 0.45 138.4 21400.00 169.94 25.03 1.639 0.75(0.34) 0.46 145.8 21410.00 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.55;6H= 2.10;24H= 4.17 S-GRAPH: VALLEY(DEV.) = 96.6%; VALLEY(UNDEV.)/DESERT= 3.4% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.43; Ybar = 0.51 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90; UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET. Date: 04/21/2014 File name: LR021477.RFS Page 14

0.75

0.75

0.75 0.250

0.600

0.100 56

56

```
Lca/L=0.3,n=.0304; Lca/L=0.4,n=.0273; Lca/L=0.5,n=.0251; Lca/L=0.6,n=.0234
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 425.53
 PEAK FLOW RATE (CFS) = 2005.01
************************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21419.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1218.00 DOWNSTREAM(FEET) = 1200.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1971.28 CHANNEL SLOPE = 0.0091
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 2005.01
 FLOW VELOCITY (FEET/SEC.) = 19.80 FLOW DEPTH (FEET) = 4.57
 TRAVEL TIME (MIN.) = 1.66 Tc (MIN.) = 36.36
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
*******************
 FLOW PROCESS FROM NODE 21419.00 TO NODE 21419.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 36.36
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.310
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 13.22
                                             0.600
                                                   56
                                     0.75
 COMMERCIAL
                     В
                            80.88
                                      0.75
                                             0.100 56
 MOBILE HOME PARK
                     В
                             29.32
                                      0.75
                                             0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
 SUBAREA AREA (ACRES) = 123.42
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.55;6H= 2.10;24H= 4.15
 S-GRAPH: VALLEY (DEV.) = 96.8%; VALLEY (UNDEV.) / DESERT = 3.2%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.48; Fm(INCH/HR) = 0.42; Ybar = 0.50
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;
 3HR = 0.98; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2470.2
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241; Lca/L=0.6,n=.0225
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 457.59
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2013.78
 TOTAL AREA(ACRES) = 2470.2
                           PEAK FLOW RATE (CFS) = 2013.78
```

```
5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
FLOW PROCESS FROM NODE 21419.00 TO NODE 21420.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1200.00 DOWNSTREAM(FEET) = 1170.00
 FLOW LENGTH (FEET) = 3014.53 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 19.00 GIVEN BOX HEIGHT (FEET) = 5.00
 *GIVEN BOX HEIGHT(FEET) = 5.00 ESTIMATED BOX BASEWIDTH(FEET) = 25.26
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.94
 BOX-FLOW(CFS) = 2013.78
 BOX-FLOW TRAVEL TIME (MIN.) = 3.15 Tc (MIN.) = 39.51
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21420.00 = 24292.93 FEET.
******************
 FLOW PROCESS FROM NODE 21420.00 TO NODE 21420.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 39.51
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.246
 SUBAREA LOSS RATE DATA (AMC II):
                    SCS SOIL AREA
  DEVELOPMENT TYPE/
                                      Fρ
                                                      SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                              73.53
                                                      56
 COMMERCIAL
                       В
                                       0.75
                                               0.100
 MOBILE HOME PARK
                       B
                              59.58
                                       0.75
                                               0.250
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     B 44.41
                                       0.75
                                               0.600
                                                      56
 PUBLIC PARK
                        В
                              28.10
                                       0.75
                                               0.850
                                                      56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                             24.44
                                       0.75
                                               0.400
                                                      56
                       В
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                             4.29
                                       0.75
                                               0.700
                                                      56
                      В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.365
 SUBAREA AREA (ACRES) = 234.35
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.55;6H= 2.09;24H= 4.13
 S-GRAPH: VALLEY(DEV.) = 97.1%; VALLEY(UNDEV.) / DESERT = 2.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.40; Ybar = 0.48
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2704.5
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21420.00 = 24292.93 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0283; Lca/L=0.4, n=.0253; Lca/L=0.5, n=.0233; Lca/L=0.6, n=.0217
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 507.77
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2138.18
 TOTAL AREA(ACRES) = 2704.5 PEAK FLOW RATE(CFS) = 2138.18
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
       Date: 04/21/2014
                       File name: LR021477.RFS
                                                    Page 16
```

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
*************************
                                                                       *************************
 FLOW PROCESS FROM NODE 21420.00 TO NODE 21421.00 IS CODE = 48
                                                                        FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 15.1
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                        >>>>DEFINE MEMORY BANK # 2 <<<<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
                                                                       _____
                                                                        PEAK FLOWRATE TABLE FILE NAME: 21070.DNA
 ELEVATION DATA: UPSTREAM(FEET) = 1170.00 DOWNSTREAM(FEET) = 1159.00
                                                                        MEMORY BANK # 2 DEFINED AS FOLLOWS:
 FLOW LENGTH (FEET) = 874.60 MANNING'S N = 0.014
                                                                        PEAK FLOW RATE (CFS) = 4925.57 Tc (MIN.) = 57.43
 GIVEN BOX BASEWIDTH(FEET) = 19.00 GIVEN BOX HEIGHT(FEET) = 5.00
                                                                        AREA-AVERAGED Fm(INCH/HR) = 0.50 Ybar = 0.53
 *GIVEN BOX HEIGHT(FEET) = 5.00 ESTIMATED BOX BASEWIDTH(FEET) = 24.00
                                                                        TOTAL AREA (ACRES) = 11023.9
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 17.82
                                                                        LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
 BOX-FLOW(CFS) = 2138.18
                                                                       ******************
 BOX-FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 40.33
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
                                                                        FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 14.0
*******************
                                                                        >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
                                                                       ______
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 81
                                                                        MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
                                                                        PEAK FLOW RATE (CFS) = 4925.57 Tc (MIN.) = 57.43
 MAINLINE Tc (MIN.) = 40.33
                                                                        AREA-AVERAGED Fm(INCH/HR) = 0.50 Ybar = 0.53
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 1.231
                                                                        TOTAL AREA(ACRES) = 11023.9
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                       ******************
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                    В
                          0.85
                                  0.75
                                           0.850
                                                                        FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 12
 COMMERCIAL
                    В
                            0.87
                                    0.75
                                           0.100
                                                                       ______
 RESIDENTIAL
                                                                        >>>>CLEAR MEMORY BANK # 2 <<<<
 "3-4 DWELLINGS/ACRE" B
                            0.17
                                    0.75
                                           0.600
                                                                       _____
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                       ******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
 SUBAREA AREA(ACRES) = 1.89
                                                                        FLOW PROCESS FROM NODE 21070.00 TO NODE 21421.00 IS CODE = 54
                                                                       ______
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.36;30M= 0.74;1H= 0.97;3H= 1.55;6H= 2.09;24H= 4.13
                                                                        >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 S-GRAPH: VALLEY(DEV.) = 97.1%; VALLEY(UNDEV.) / DESERT = 2.9%
                                                                        >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                       ______
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.40; Ybar = 0.48
                                                                        ELEVATION DATA: UPSTREAM(FEET) = 1183.00 DOWNSTREAM(FEET) = 1159.00
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                        CHANNEL LENGTH THRU SUBAREA (FEET) = 1867.34 CHANNEL SLOPE = 0.0129
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
                                                                        CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
                                                                        MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2706.4
                                                                        CHANNEL FLOW THRU SUBAREA (CFS) = 4925.57
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
                                                                        FLOW VELOCITY (FEET/SEC.) = 27.86 FLOW DEPTH (FEET) = 5.65
                                                                        TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 58.55
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0280; Lca/L=0.4,n=.0251; Lca/L=0.5,n=.0230; Lca/L=0.6,n=.0215
                                                                        LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 508.12
                                                                       ******************
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2113.99
 TOTAL AREA (ACRES) = 2706.4 PEAK FLOW RATE (CFS) = 2138.18
                                                                        FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 81
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                       _____
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
                                                                        MAINLINE Tc(MIN.) = 58.55
                                                                        * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.984
*******************
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 10
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                        Fp
                                                                                                                         SCS
                                                                                                                  αA
                                                                            LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                        COMMERCIAL
                                                                                                  51.49
                                                                                                         0.75
                                                                                                                  0.100
                                                                        RESIDENTIAL
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 17

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 18

```
"3-4 DWELLINGS/ACRE"
                       В
                                5.09
                                           0.75 0.600 56
                         В
                                  3.37
                                           0.75
                                                  0.850 56
 PUBLIC PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185
 SUBAREA AREA(ACRES) = 59.95
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.01;3H= 1.74;6H= 2.45;24H= 5.29
 S-GRAPH: VALLEY (DEV.) = 71.9%; VALLEY (UNDEV.) / DESERT= 28.1%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.98; LAG(HR) = 0.78; Fm(INCH/HR) = 0.49; Ybar = 0.53
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0258; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213; Lca/L=0.6,n=.0199
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2332.45
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 4948.24
 TOTAL AREA(ACRES) = 11083.8
                               PEAK FLOW RATE (CFS) = 4948.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 4948.24
                                 Tc(MIN.) = 58.55
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.53
 TOTAL AREA (ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 2138.18 Tc (MIN.) = 40.33
 AREA-AVERAGED Fm(INCH/HR) = 0.40 Ybar = 0.48
 TOTAL AREA(ACRES) = 2706.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.38;24H= 5.06
 S-GRAPH: VALLEY(DEV.) = 76.8%; VALLEY(UNDEV.) / DESERT = 23.2%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.98; LAG(HR) = 0.78; Fm(INCH/HR) = 0.48; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 13790.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0258; Lca/L=0.4, n=.0232; Lca/L=0.5, n=.0213; Lca/L=0.6, n=.0199
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2802.39
 PEAK FLOW RATE (CFS) = 5837.62
```

```
FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<<
*******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21422.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1159.00 DOWNSTREAM(FEET) = 1153.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 938.13 CHANNEL SLOPE = 0.0064
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 5837.62
 FLOW VELOCITY (FEET/SEC.) = 22.69 FLOW DEPTH (FEET) = 7.40
 TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 59.24
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
******************
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21422.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 59.24
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.977
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                      В
                            65.40 0.75
                                             0.100
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.90
                                      0.75
                                             0.600
                                                    56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                      В
                             4.85
                                      0.75
                                             0.200
                                                    56
 PUBLIC PARK
                             2.00
                                      0.75
                                             0.850
                                                    56
                       В
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                    В
                          47.14
                                      0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.241
 SUBAREA AREA(ACRES) = 121.29
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.05
 S-GRAPH: VALLEY(DEV.) = 77.0%; VALLEY(UNDEV.)/DESERT= 23.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.99; LAG(HR) = 0.79; Fm(INCH/HR) = 0.47; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13911.6
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0257; Lca/L=0.4,n=.0230; Lca/L=0.5,n=.0212; Lca/L=0.6,n=.0198
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2832.30
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 5859.56
 TOTAL AREA(ACRES) = 13911.6 PEAK FLOW RATE(CFS) = 5859.56
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Date: 04/21/2014 File name: LR0214ZZ.RES Page 19 Date: 04/21/2014 File name: LR0214ZZ.RES Page 20

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21423.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1153.00 DOWNSTREAM(FEET) = 1148.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 670.94 CHANNEL SLOPE = 0.0075
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 5859.56
 FLOW VELOCITY (FEET/SEC.) = 24.02 FLOW DEPTH (FEET) = 7.12
 TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 59.70
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
******************
 FLOW PROCESS FROM NODE 21423.00 TO NODE 21423.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 59.70
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.973
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fρ
                                                 Αp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                               1.99
                                         0.75
                                                0.600
                                                       56
                        В
                               11.78
                                                 0.100
 COMMERCIAL
                                         0.75
                                                       56
 MOBILE HOME PARK
                        В
                                4.78
                                         0.75
                                                 0.250
                                                        56
 PUBLIC PARK
                                1.74
                                         0.75
                                                 0.850
 RESIDENTIAL
                                                       56
 "11+ DWELLINGS/ACRE"
                                0.99
                                         0.75
                                                0.200
                        В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
 SUBAREA AREA(ACRES) = 21.28
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.05
 S-GRAPH: VALLEY(DEV.) = 77.0%; VALLEY(UNDEV.) / DESERT = 23.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.47; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13932.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0256; Lca/L=0.4,n=.0229; Lca/L=0.5,n=.0211; Lca/L=0.6,n=.0197
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2837.51
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 5842.27
 TOTAL AREA (ACRES) = 13932.8
                              PEAK FLOW RATE (CFS) = 5859.56
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
```

```
FLOW PROCESS FROM NODE 21423.00 TO NODE 21439.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1148.00 DOWNSTREAM(FEET) = 1143.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 702.31 CHANNEL SLOPE = 0.0071
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 5859.56
 FLOW VELOCITY (FEET/SEC.) = 23.63 FLOW DEPTH (FEET) = 7.21
 TRAVEL TIME (MIN.) = 0.50 Tc (MIN.) = 60.20
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
******************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 60.20
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.968
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                      SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                               0.600
 "3-4 DWELLINGS/ACRE"
                       В
                               0.52
                                        0.75
 PUBLIC PARK
                        В
                               1.21
                                       0.75
                                               0.850
                                                       56
                                               0.250
                                                       56
 MOBILE HOME PARK
                        В
                               4.21
                                        0.75
 SCHOOL
                               0.18
                                        0.75
                                               0.600
                                                       56
                               0.96
 COMMERCIAL
                                        0.75
                                               0.100
                                                       56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.39
                                       0.75
                                               0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.358
 SUBAREA AREA(ACRES) = 7.47
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.04
 S-GRAPH: VALLEY(DEV.) = 77.1%; VALLEY(UNDEV.)/DESERT= 22.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.47; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 13940.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0255; Lca/L=0.4,n=.0229; Lca/L=0.5,n=.0210; Lca/L=0.6,n=.0196
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2839.09
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 5812.78
 TOTAL AREA(ACRES) = 13940.3
                                PEAK FLOW RATE (CFS) = 5859.56
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
*******************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 1
```

File name: LR021477.RFS

Page 22

Date: 04/21/2014

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                STREET FLOW DEPTH (FEET) = 0.56
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 20.21
 TOTAL NUMBER OF STREAMS = 2
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.79
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.13
 PEAK FLOW RATE (CFS) = 5859.56 Tc (MIN.) = 60.20
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 6.36
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52
                                                                              * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 3.729
 TOTAL AREA (ACRES) = 13940.3
                                                                              SUBAREA LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                   SCS
**********************
                                                                                  LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21430.00 TO NODE 21431.00 IS CODE = 21
                                                                              RESIDENTIAL
                                                                              "5-7 DWELLINGS/ACRE"
                                                                                                  в 0.32
                                                                                                                    0.75
                                                                                                                            0.500
                                                                                                                                   56
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                              COMMERCIAL
                                                                                                    B 5.86
                                                                                                                    0.75
                                                                                                                            0.100
                                                                                                                                   56
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                              RESIDENTIAL
_____
                                                                              "3-4 DWELLINGS/ACRE" B 0.61 0.75 0.600
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 200.00
 ELEVATION DATA: UPSTREAM(FEET) = 1220.00 DOWNSTREAM(FEET) = 1214.00
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.164
                                                                              SUBAREA AREA (ACRES) = 6.79 SUBAREA RUNOFF (CFS) = 22.04
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                              EFFECTIVE AREA(ACRES) = 12.70 AREA-AVERAGED Fm(INCH/HR) = 0.18
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.103
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.23
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 4.255
                                                                              TOTAL AREA (ACRES) = 12.7 PEAK FLOW RATE (CFS) =
                                                                                                                                    40.62
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                             Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
                                               0.500
 "5-7 DWELLINGS/ACRE" B 0.20
                                                     56 6.53
                                       0.75
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                                                                              DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.09
 "3-4 DWELLINGS/ACRE"
                    В
                            2.38
                                       0.75
                                               0.600
                                                     56
                                                           6.92
                                                                              FLOW VELOCITY (FEET/SEC.) = 4.01 DEPTH*VELOCITY (FT*FT/SEC.) = 2.40
                               3.33
                                                           5.10
                                                                              LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21432.00 = 486.00 FEET.
 COMMERCIAL
                       В
                                       0.75
                                               0.100
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             ******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.315
 SUBAREA RUNOFF (CFS) = 21.38
                                                                              FLOW PROCESS FROM NODE 21432.00 TO NODE 21433.00 IS CODE = 63
 TOTAL AREA (ACRES) = 5.91 PEAK FLOW RATE (CFS) = 21.38
                                                                             ______
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              >>>> (STREET TABLE SECTION # 14 USED) <<<<
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
                                                                             ______
                                                                              UPSTREAM ELEVATION(FEET) = 1209.00 DOWNSTREAM ELEVATION(FEET) = 1206.00
******************
                                                                              STREET LENGTH (FEET) = 254.00 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 21431.00 TO NODE 21432.00 IS CODE = 63
                                                                              STREET HALFWIDTH (FEET) = 39.00
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
______
 UPSTREAM ELEVATION(FEET) = 1214.00 DOWNSTREAM ELEVATION(FEET) = 1209.00
 STREET LENGTH (FEET) = 286.00 CURB HEIGHT (INCHES) = 8.0
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 39.00
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                               50.46
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                STREET FLOW DEPTH (FEET) = 0.68
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 26.41
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.65
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.03
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 7.52
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.41
                                                                              * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.372
```

Date: 04/21/2014

File name: LR0214ZZ.RES

Page 24

Date: 04/21/2014

File name: LR021477.RFS

Page 23

SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "5-7 DWELLINGS/ACRE" B 0.33 0.75 0.500 56  COMMERCIAL B 5.82 0.75 0.100 56  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 0.58 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.163  SUBAREA AREA(ACRES) = 6.73 SUBAREA RUNOFF(CFS) = 19.69  EFFECTIVE AREA(ACRES) = 19.43 AREA-AVERAGED FM(INCH/HR) = 0.16  AREA-AVERAGED FP(INCH/HR) = 0.75 AREA-AVERAGED AP = 0.21  TOTAL AREA(ACRES) = 19.4 PEAK FLOW RATE(CFS) = 56.24	"3-4 DWELLINGS/ACRE" B 0.86 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.161  SUBAREA AREA (ACRES) = 9.91 SUBAREA RUNOFF(CFS) = 25.87  EFFECTIVE AREA (ACRES) = 29.34 AREA-AVERAGED Fm(INCH/HR) = 0.14  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19  TOTAL AREA (ACRES) = 29.3 PEAK FLOW RATE(CFS) = 75.95  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 35.47  FLOW VELOCITY(FEET/SEC.) = 3.91 DEPTH*VELOCITY(FT*FT/SEC.) = 3.00  LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21434.00 = 1089.00 FEET.
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87	**************************************
END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.70	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
**************************************	UPSTREAM ELEVATION(FEET) = 1202.00 DOWNSTREAM ELEVATION(FEET) = 1195.00 STREET LENGTH(FEET) = 602.00 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 39.00
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
UPSTREAM ELEVATION (FEET) = 1206.00 DOWNSTREAM ELEVATION (FEET) = 1202.00 STREET LENGTH (FEET) = 349.00 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 97.55  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.82  HALFSTREET FLOOD WIDTH(FEET) = 41.09  AVERAGE FLOW VELOCITY(FEET/SEC.) = 4.11  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.39  STREET FLOW TRAVEL TIME(MIN.) = 2.44 Tc(MIN.) = 11.48
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.18  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.75  HALFSTREET FLOOD WIDTH(FEET) = 33.44  AVERAGE FLOW VELOCITY(FEET/SEC.) = 3.84  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.87  STREET FLOW TRAVEL TIME(MIN.) = 1.52 TC(MIN.) = 9.03  * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.021	* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.617 SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL  "5-7 DWELLINGS/ACRE" B 0.83 0.75 0.500 56 COMMERCIAL B 16.10 0.75 0.100 56 RESIDENTIAL
SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "5-7 DWELLINGS/ACRE" B 0.43 0.75 0.500 56	"3-4 DWELLINGS/ACRE" B 2.38 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.179  SUBAREA AREA (ACRES) = 19.31 SUBAREA RUNOFF(CFS) = 43.16  EFFECTIVE AREA (ACRES) = 48.65 AREA-AVERAGED Fm(INCH/HR) = 0.14
COMMERCIAL B 8.62 0.75 0.100 56 RESIDENTIAL	AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19 TOTAL AREA(ACRES) = 48.7 PEAK FLOW RATE(CFS) = 108.45

 Date: 04/21/2014
 File name: LR0214ZZ.RES
 Page 25
 Date: 04/21/2014
 File name: LR0214ZZ.RES
 Page 26

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.85 HALFSTREET FLOOD WIDTH(FEET) = 43.59
 FLOW VELOCITY (FEET/SEC.) = 4.20 DEPTH*VELOCITY (FT*FT/SEC.) = 3.56
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 602.0 FT WITH ELEVATION-DROP = 7.0 FT, IS 48.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21435.00
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21435.00 = 1691.00 FEET.
*****
 FLOW PROCESS FROM NODE 21435.00 TO NODE 21436.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1195.00 DOWNSTREAM ELEVATION(FEET) = 1183.00
 STREET LENGTH (FEET) = 889.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 138.96
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 47.97
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.15
 STREET FLOW TRAVEL TIME (MIN.) = 3.18 Tc (MIN.) = 14.66
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.259
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                     B 2.44
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                 0.600 56
                      B 28.76 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.28
                                         0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.142
 SUBAREA AREA (ACRES) = 31.48 SUBAREA RUNOFF (CFS) = 61.00
 EFFECTIVE AREA(ACRES) = 80.13 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 80.1 PEAK FLOW RATE (CFS) = 153.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
```

```
DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 50.62
 FLOW VELOCITY (FEET/SEC.) = 4.74 DEPTH*VELOCITY (FT*FT/SEC.) = 4.35
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 889.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 73.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21436.00
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21436.00 = 2580.50 FEET.
******************
 FLOW PROCESS FROM NODE 21436.00 TO NODE 21437.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1183.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1172.00
 FLOW LENGTH (FEET) = 717.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 29.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.23
 PIPE-FLOW(CFS) = 153.79
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 15.44
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.190
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 Ap
                                                         SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                       B 22.52 0.75 0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.08 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.177
 SUBAREA AREA (ACRES) = 26.60 SUBAREA RUNOFF (CFS) = 49.26
 EFFECTIVE AREA(ACRES) = 106.73 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA(ACRES) = 106.7 PEAK FLOW RATE(CFS) =
                                                        198.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 44.26
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.41
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.44
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 27

Date: 04/21/2014 File name: LR0214ZZ.RES

END OF SUBAREA STREET FLOW HYDRAULICS:

Page 28

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<

Date: 04/21/2014

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<

File name: LR0214ZZ.RES

6.5

56

56

Page 30

Date: 04/21/2014 File name: LR0214ZZ.RES Page 29

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 21438.00 TO NODE 21439.00 IS CODE = 33

```
*************************
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                               FLOW PROCESS FROM NODE 21440.00 TO NODE 21441.00 IS CODE = 21
 TIME OF CONCENTRATION (MIN.) = 17.43
 RAINFALL INTENSITY (INCH/HR) = 2.04
                                                                               >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 AREA-AVERAGED Fm(INCH/HR) = 0.13
                                                                               >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.17
                                                                               INITIAL SUBAREA FLOW-LENGTH (FEET) = 665.71
 EFFECTIVE STREAM AREA(ACRES) = 176.56
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1142.00 DOWNSTREAM(FEET) = 1138.00
 TOTAL STREAM AREA(ACRES) = 176.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  302.90
                                                                               Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 ** CONFLUENCE DATA **
                                                                               SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137
 STREAM
         O TC AREA
                                  HEADWATER
                                                                               * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.530
 NUMBER (CFS) (MIN.) (ACRES)
                                                                               SUBAREA To AND LOSS RATE DATA(AMC II):
                                 NODE
   1 5859.56 60.20 13940.30 20120.00
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                    SCS Tc
                                                                                                                  Fр
                                                                                                                            Ар
   2 302.90 17.43 176.56 21430.00
                                                                                   LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                                   В
                                                                                                           6.41 0.75 0.250 56 12.59
                                                                               MOBILE HOME PARK
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                               PUBLIC PARK
                                                                                                     В
                                                                                                           0.38 0.75
                                                                                                                            0.850 56 18.09
 UNIT-HYDROGRAPH DATA:
                                                                               RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" B 0.07
SCHOOL B 0.09
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.03
                                                                                                                     0.75
                                                                                                                             0.600
                                                                                                                                    56 15.43
 S-GRAPH: VALLEY(DEV.) = 77.3%; VALLEY(UNDEV.) / DESERT = 22.7%
                                                                                                                     0.75
                                                                                                                             0.600
                                                                                                                                    56 15.43
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                               RESIDENTIAL
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.47; Ybar = 0.52
                                                                               "11+ DWELLINGS/ACRE"
                                                                                                    В
                                                                                                          0.25 0.75
                                                                                                                             0.200
                                                                                                                                    56 12.14
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.288
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                               SUBAREA RUNOFF (CFS) = 15.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14116.9
                                                                               TOTAL AREA(ACRES) = 7.20 PEAK FLOW RATE(CFS) = 15.00
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0255; Lca/L=0.4,n=.0229; Lca/L=0.5,n=.0210; Lca/L=0.6,n=.0196
                                                                               5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2886.05
                                                                             ******************
 PEAK FLOW RATE (CFS) = 5890.18
                                                                               FLOW PROCESS FROM NODE 21441.00 TO NODE 21442.00 IS CODE = 63
******************
                                                                             ______
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21443.00 IS CODE = 54
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                               UPSTREAM ELEVATION(FEET) = 1138.00 DOWNSTREAM ELEVATION(FEET) = 1136.00
STREET LENGTH (FEET) = 701.10 CURB HEIGHT (INCHES) = 6.0
 ELEVATION DATA: UPSTREAM(FEET) = 1143.00 DOWNSTREAM(FEET) = 1135.00
                                                                               STREET HALFWIDTH (FEET) = 18.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1468.88 CHANNEL SLOPE = 0.0054
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 CHANNEL FLOW THRU SUBAREA(CFS) = 5890.18
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 FLOW VELOCITY (FEET/SEC.) = 21.45 FLOW DEPTH (FEET) = 7.74
 TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 61.34
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                29.58
______
                                                                                 ***STREET FLOWING FULL***
 TOTAL NUMBER OF STREAMS = 2
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                 STREET FLOW DEPTH(FEET) = 0.66
 PEAK FLOW RATE (CFS) = 5890.18 Tc (MIN.) = 61.34
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 26.07
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.07
 TOTAL AREA(ACRES) = 14116.9
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.37
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 31

\_\_\_\_\_\_

```
STREET FLOW TRAVEL TIME (MIN.) = 5.66 Tc (MIN.) = 17.79
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.011
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            Аp
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                     В 1.22
 PUBLIC PARK
                                    0.75
                                              0.850
 MOBILE HOME PARK
                     B 16.66
                                      0.75
                                              0.250 56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.05 0.75 0.200 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.291
 SUBAREA AREA (ACRES) = 17.93 SUBAREA RUNOFF (CFS) = 28.95
 EFFECTIVE AREA(ACRES) = 25.13 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.29
 TOTAL AREA (ACRES) = 25.1 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.73 HALFSTREET FLOOD WIDTH (FEET) = 29.49
 FLOW VELOCITY (FEET/SEC.) = 2.24 DEPTH*VELOCITY (FT*FT/SEC.) = 1.63
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 701.1 FT WITH ELEVATION-DROP = 2.0 FT, IS 33.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21442.00
 LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21442.00 = 1366.81 FEET.
*****************
 FLOW PROCESS FROM NODE 21442.00 TO NODE 21443.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1136.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1135.00
 FLOW LENGTH (FEET) = 150.38 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 21.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.49
 PIPE-FLOW(CFS) = 40.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.30 Tc (MIN.) = 18.09
 LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21443.00 = 1517.19 FEET.
*******************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 18.09
 RAINFALL INTENSITY (INCH/HR) = 1.99
 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.29
```

File name: LR021477.RFS

Page 33

Date: 04/21/2014

```
EFFECTIVE STREAM AREA(ACRES) = 25.13
 TOTAL STREAM AREA(ACRES) = 25.13
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 40.59
 ** CONFLUENCE DATA **
         0
                 Tc
                        AREA HEADWATER
 STREAM
 NUMBER (CFS) (MIN.) (ACRES) NODE
  1 5890.18 61.34 14116.86 20120.00
         40.59 18.09 25.13 21440.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.03
 S-GRAPH: VALLEY (DEV.) = 77.4%; VALLEY (UNDEV.) / DESERT= 22.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.02; LAG(HR) = 0.82; Fm(INCH/HR) = 0.47; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14142.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0253; Lca/L=0.4, n=.0227; Lca/L=0.5, n=.0208; Lca/L=0.6, n=.0195
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2891.86
 PEAK FLOW RATE (CFS) = 5801.34
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 5890.18)
 PEAK FLOW RATE (CFS) USED = 5890.18
******************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21453.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1135.00 DOWNSTREAM(FEET) = 1118.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1571.70 CHANNEL SLOPE = 0.0108
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 5890.18
 FLOW VELOCITY (FEET/SEC.) = 27.52 FLOW DEPTH (FEET) = 6.49
 TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 62.29
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
*******************
 FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 5890.18 Tc (MIN.) = 62.29
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52
 TOTAL AREA(ACRES) = 14142.0
******************
 FLOW PROCESS FROM NODE 21450.00 TO NODE 21451.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 526.00
 ELEVATION DATA: UPSTREAM(FEET) = 1132.00 DOWNSTREAM(FEET) = 1128.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.927
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.695
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS Tc
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 MOBILE HOME PARK
                      В
                               3.07
                                    0.75 0.250 56 10.93
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250
 SUBAREA RUNOFF (CFS) = 6.93
 TOTAL AREA (ACRES) = 3.07 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21451.00 TO NODE 21452.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
 UPSTREAM NODE ELEVATION (FEET) = 1128.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1119.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 853.42
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.242
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                                       Fρ
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                    В
 ".4 DWELLING/ACRE"
                             0.02
                                       0.75
                                               0.900
                                                     56
 MOBILE HOME PARK
                     В 18.33
                                       0.75
                                               0.250
 PUBLIC PARK
                              0.30
                                       0.75
                                               0.850 56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.28
                                       0.75
                                               0.200
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.259
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.09
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.63
 AVERAGE FLOW DEPTH(FEET) = 0.64 FLOOD WIDTH(FEET) = 37.58
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.92 Tc (MIN.) = 14.85
 SUBAREA AREA (ACRES) = 18.93 SUBAREA RUNOFF (CFS) = 34.89
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
 TOTAL AREA (ACRES) = 22.0
                               PEAK FLOW RATE(CFS) =
                                                         40.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.73 FLOOD WIDTH (FEET) = 47.43
 FLOW VELOCITY (FEET/SEC.) = 3.98 DEPTH*VELOCITY (FT*FT/SEC) = 2.89
```

```
******************
 FLOW PROCESS FROM NODE 21452.00 TO NODE 21453.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1119.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1118.00
 FLOW LENGTH (FEET) = 197.38 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 25.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.55
 PIPE-FLOW(CFS) =
                    40.57
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 15.31
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.201
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                         Fρ
                                                         SCS
                                                   Αp
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
 SUBAREA AREA(ACRES) = 0.00
                               SUBAREA RUNOFF (CFS) = 0.00
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
 TOTAL AREA (ACRES) = 22.0
                                  PEAK FLOW RATE(CFS) =
                                                           40.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                            STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
  *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21453.00 = 1576.80 FEET.
FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.31
 RAINFALL INTENSITY (INCH/HR) = 2.20
```

LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21452.00 = 1379.42 FEET.

Date: 04/21/2014 File name: LR0214ZZ.RES Page 35

File name: LR0214ZZ.RES

Page 36

Date: 04/21/2014

```
AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                              >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 AREA-AVERAGED Ap = 0.26
                                                                              >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 EFFECTIVE STREAM AREA(ACRES) = 22.00
                                                                             _____
 TOTAL STREAM AREA(ACRES) = 22.00
                                                                              INITIAL SUBAREA FLOW-LENGTH (FEET) = 626.73
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1222.00 DOWNSTREAM(FEET) = 1219.00
                                 40.57
 ** CONFLUENCE DATA **
        O Tc
                        AREA
                                 HEADWATER
                                                                              Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 NUMBER (CFS) (MIN.) (ACRES) NODE
                                                                              SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.633
   1 5890.18 62.29 14141.99 20120.00
                                                                              * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.596
         40.57 15.31 22.00 21450.00
                                                                              SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                  SCS Tc
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                  LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                              RESIDENTIAL
 UNIT-HYDROGRAPH DATA:
                                                                              "3-4 DWELLINGS/ACRE" B 2.48
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.37;24H= 5.03
                                                                                                                    0.75
                                                                                                                            0.600
                                                                                                                                   56 15.77
 S-GRAPH: VALLEY (DEV.) = 77.4%; VALLEY (UNDEV.) / DESERT= 22.6%
                                                                              RESIDENTIAL
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                              "5-7 DWELLINGS/ACRE" B 5.98
                                                                                                                    0.75 0.500 56 14.89
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.47; Ybar = 0.52
                                                                                                   В
                                                                                                            1.53
                                                                                                                    0.75 0.100 56 11.63
                                                                              COMMERCIAL
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.464
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                              SUBAREA RUNOFF(CFS) = 20.22
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14164.0
                                                                              TOTAL AREA(ACRES) = 9.99 PEAK FLOW RATE(CFS) =
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  Lca/L=0.3,n=.0251; Lca/L=0.4,n=.0225; Lca/L=0.5,n=.0206; Lca/L=0.6,n=.0193
                                                                              5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2897.15
                                                                             ******************
 PEAK FLOW RATE (CFS) = 5719.87
   (UPSTREAM NODE PEAK FLOW RATE (CFS) = 5890.18)
                                                                              FLOW PROCESS FROM NODE 21461.00 TO NODE 21462.00 IS CODE = 63
 PEAK FLOW RATE(CFS) USED = 5890.18
                                                                              >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                              >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 21453.00 TO NODE 21469.00 IS CODE = 54
                                                                             ______
                                                                              UPSTREAM ELEVATION(FEET) = 1219.00 DOWNSTREAM ELEVATION(FEET) = 1216.00
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                              STREET LENGTH (FEET) = 478.63 CURB HEIGHT (INCHES) = 6.0
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                              STREET HALFWIDTH (FEET) = 18.00
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1118.00 DOWNSTREAM(FEET) = 1117.00
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 519.47 CHANNEL SLOPE = 0.0019
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 5890.18
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 FLOW VELOCITY (FEET/SEC.) = 14.60 FLOW DEPTH (FEET) = 9.73
                                                                              STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 62.89
                                                                              Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
                                                                              Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
*******************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                                STREET FLOW DEPTH(FEET) = 0.57
 TOTAL NUMBER OF STREAMS = 2
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 21.37
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.61
 PEAK FLOW RATE (CFS) = 5890.18 Tc (MIN.) = 62.89
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.48
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.52
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 3.05 Tc (MIN.) = 14.69
 TOTAL AREA(ACRES) = 14164.0
                                                                              * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.257
                                                                              SUBAREA LOSS RATE DATA (AMC II):
******************
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fр
                                                                                                                                   SCS
                                                                                                                          Дp
 FLOW PROCESS FROM NODE 21460.00 TO NODE 21461.00 IS CODE = 21
                                                                                  LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 38

```
RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                             6.45
                                      0.75
                                           0.500
 COMMERCIAL
                     В
                             0.09
                                      0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.494
 SUBAREA AREA (ACRES) = 6.54 SUBAREA RUNOFF (CFS) = 11.11
 EFFECTIVE AREA(ACRES) = 16.53 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 16.5 PEAK FLOW RATE (CFS) =
                                                     28.28
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.10
 FLOW VELOCITY (FEET/SEC.) = 2.69 DEPTH*VELOCITY (FT*FT/SEC.) = 1.57
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21462.00 = 1105.36 FEET.
******************
 FLOW PROCESS FROM NODE 21462.00 TO NODE 21463.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1216.00 DOWNSTREAM(FEET) = 1211.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.66 CHANNEL SLOPE = 0.0186
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              28.28
 FLOW VELOCITY (FEET/SEC.) = 9.00 FLOW DEPTH (FEET) = 0.85
 TRAVEL TIME (MIN.) = 0.50 Tc (MIN.) = 15.18
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21463.00 = 1374.02 FEET.
******************
 FLOW PROCESS FROM NODE 21463.00 TO NODE 21463.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 15.18
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.212
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            Ap SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             0.34
                                      0.75
                                             0.600
                                                   56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 8.08
                                      0.75
                                             0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.504
 SUBAREA AREA(ACRES) = 8.42 SUBAREA RUNOFF(CFS) = 13.91
 EFFECTIVE AREA(ACRES) = 24.95 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 24.9 PEAK FLOW RATE (CFS) =
                                                     41.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1211.00 DOWNSTREAM(FEET) = 1205.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 384.00 CHANNEL SLOPE = 0.0156
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            41.53
 FLOW VELOCITY (FEET/SEC.) = 9.34 FLOW DEPTH (FEET) = 1.07
 TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 15.87
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21464.00 = 1758.02 FEET.
*******************
 FLOW PROCESS FROM NODE 21464.00 TO NODE 21464.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 15.87
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.154
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 6.76 0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 10.83
 EFFECTIVE AREA(ACRES) = 31.71 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 31.7 PEAK FLOW RATE (CFS) =
                                                 51.06
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
***********************
 FLOW PROCESS FROM NODE 21464.00 TO NODE 21465.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1205.00 DOWNSTREAM(FEET) = 1197.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 540.00 CHANNEL SLOPE = 0.0148
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 9.66 FLOW DEPTH (FEET) = 1.20
 TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 16.80
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21465.00 = 2298.02 FEET.
FLOW PROCESS FROM NODE 21465.00 TO NODE 21465.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_______
 MAINLINE Tc(MIN.) = 16.80
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 2.082
```

FLOW PROCESS FROM NODE 21463.00 TO NODE 21464.00 IS CODE = 54

Date: 04/21/2014 File name: LR0214ZZ.RES Page 39

File name: LR021477.RFS

Date: 04/21/2014

Page 40

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                                  Fp
                                           Дp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                             0.08
                                     0.75
                                            0.100
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 7.60 0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.496
 SUBAREA AREA (ACRES) = 7.68 SUBAREA RUNOFF (CFS) = 11.83
 EFFECTIVE AREA(ACRES) = 39.39 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 39.4 PEAK FLOW RATE (CFS) = 60.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21465.00 TO NODE 21466.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1197.00 DOWNSTREAM(FEET) = 1187.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 678.50 CHANNEL SLOPE = 0.0147
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 10.08 FLOW DEPTH (FEET) = 1.31
 TRAVEL TIME (MIN.) = 1.12 Tc (MIN.) = 17.92
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21466.00 = 2976.52 FEET.
FLOW PROCESS FROM NODE 21466.00 TO NODE 21466.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 17.92
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 2.003
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                            0.100
 COMMERCIAL
                             0.26
                                     0.75
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 8.00
                                     0.75
                                            0.500
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.11
                                     0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.489
 SUBAREA AREA(ACRES) = 8.37
                            SUBAREA RUNOFF (CFS) = 12.33
 EFFECTIVE AREA(ACRES) = 47.76 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
                  47.8 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                                                   70.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21466.00 TO NODE 21467.00 IS CODE = 54
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1187.00 DOWNSTREAM(FEET) = 1170.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1180.01 CHANNEL SLOPE = 0.0144
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 70.34
 FLOW VELOCITY (FEET/SEC.) = 10.39 FLOW DEPTH (FEET) = 1.41
 TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 19.81
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21467.00 = 4156.53 FEET.
******************
 FLOW PROCESS FROM NODE 21467.00 TO NODE 21467.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 19.81
 * 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.886
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
   LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                          7.62
                                   0.75
                                          0.500
                                                 56
 AGRICULTURAL FAIR COVER
                     B 1.76
                                   0.63
 "ORCHARDS"
                                          1.000
                                                 65
 COMMERCIAL
                     B
                            2.13
                                    0.75
                                          0.100
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.15
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.504
 SUBAREA AREA(ACRES) = 11.66 SUBAREA RUNOFF(CFS) = 16.02
 EFFECTIVE AREA(ACRES) = 59.42 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 59.4 PEAK FLOW RATE (CFS) =
                                                 81.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
******************
 FLOW PROCESS FROM NODE 21467.00 TO NODE 21468.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1170.00 DOWNSTREAM(FEET) = 1156.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1415.51 CHANNEL SLOPE = 0.0099
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             81.33
 FLOW VELOCITY (FEET/SEC.) = 9.36 FLOW DEPTH (FEET) = 1.64
 TRAVEL TIME (MIN.) = 2.52 Tc (MIN.) = 22.33
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21468.00 = 5572.04 FEET.
*****************
 FLOW PROCESS FROM NODE 21468.00 TO NODE 21468.00 IS CODE = 81
______
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 41

Date: 04/21/2014

			FLOW<		
MAINLINE Tc(MIN.) = 2		=======	=======	========	
* 25 YEAR RAINFALL INT			1.755		
SUBAREA LOSS RATE DATA(	AMC II):				
DEVELOPMENT TYPE/			Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
COMMERCIAL	В		0.75		
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В	0.64	0.75	0.600	56
RESIDENTIAL	_	0.01	0.70	0.000	
"5-7 DWELLINGS/ACRE"	B	11 78	0.75	0.500	5.6
AGRICULTURAL FAIR COVER		11.70	0.75	0.300	30
"ORCHARDS"		2 60	0.63	1 000	65
					03
SUBAREA AVERAGE PERVIOU				• / 1	
SUBAREA AVERAGE PERVIOU				~\ 10.0	
SUBAREA AREA (ACRES) =					
EFFECTIVE AREA(ACRES) =	75.2	5 AREA-	AVERAGED Fm	(INCH/HR) =	= 0.37
AREA-AVERAGED Fp(INCH/H					
TOTAL AREA (ACRES) =	75.2	PEAK	FLOW RATE (	CFS) =	93.55
SUBAREA AREA-AVERAGED F					
5M = 0.36; 30M = 0.74;	1HR = 0.9	7; 3HR =	1.53; 6HR =	2.04; 24HF	R = 3.87
*******	*****	******	******	******	*******
FLOW PROCESS FROM NODE	21468.00	TO NODE	21469.00 I	S CODE = 5	54
>>>>COMPUTE TRAPEZOIDA	L CHANNEL	FLOW<	<		
>>>>TRAVELTIME THRU SU	JBAREA (EX	ISTING EL	EMENT) <<<<		
.======					
ELEVATION DATA: UPSTREA CHANNEL LENGTH THRU SUE CHANNEL BASE(FEET) = MANNING'S FACTOR = 0.01 CHANNEL FLOW THRU SUBAR FLOW VELOCITY(FEET/SEC. TRAVEL TIME(MIN.) = 5 LONGEST FLOWPATH FROM N	BAREA (FEET 2.00 ".5 MAXIM REA (CFS) = 10.5 5.07 Tc (	) = 3195 Z" FACTOR UM DEPTH( 93. 1 FLOW MIN.) =	.53 CHANN = 2.000 FEET) = 4 55 DEPTH (FEET) 27.40	EL SLOPE = .50 = 1.67	0.0122
	******				
FLOW PROCESS FROM NODE	21469.00	TO NODE	21469.00 I	S CODE = 8	
FLOW PROCESS FROM NODE	21469.00	TO NODE	21469.00 I	S CODE = 8	
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE	21469.00  CA TO MAIN	TO NODE  LINE PEAK	21469.00 I 	S CODE = 8	31
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE	21469.00  ZA TO MAIN	TO NODE  LINE PEAK	21469.00 I 	S CODE = 8	31
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2	21469.00 CA TO MAIN 27.40	TO NODE	21469.00 I FLOW<	S CODE = 8	31
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT	21469.00 EA TO MAIN 27.40 EENSITY(IN	TO NODE	21469.00 I FLOW<	S CODE = 8	31
FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(	21469.00 CA TO MAIN CA TO MAIN CANCER (INCREMENTAL INCREMENTAL	TO NODE LINE PEAK CH/HR) =	21469.00 I FLOW<<<< 1.552	S CODE = 8	31
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT  SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/	21469.00 CA TO MAIN CA TO MAIN CANCERSITY (IN CANC II): SCS SOIL	TO NODELINE PEAK CH/HR) = AREA	21469.00 I FLOW<>>> 1.552 Fp	S CODE = 8	81 
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE	21469.00  CA TO MAIN  CAN TO MA	TO NODE LINE PEAK CH/HR) = AREA (ACRES)	21469.00 I FLOW<><> 1.552 Fp (INCH/HR)	S CODE = 8	SCS CN
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2  * 25 YEAR RAINFALL INT  SUBAREA LOSS RATE DATA (  DEVELOPMENT TYPE/  LAND USE  COMMERCIAL	21469.00  A TO MAIN	TO NODELINE PEAK CH/HR) = AREA	21469.00 I FLOW<>>> 1.552 Fp	S CODE = 8	81 
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE Tc (MIN.) = 2  * 25 YEAR RAINFALL INT  SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/  LAND USE  COMMERCIAL  AGRICULTURAL FAIR COVER	21469.00  A TO MAIN  TO ACT  T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14	21469.00 I FLOW<><> 1.552 Fp (INCH/HR) 0.75	Ap (DECIMAL) 0.100	SCS CN 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 2  * 25 YEAR RAINFALL INT  SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL  AGRICULTURAL FAIR COVER  "ORCHARDS"	21469.00  A TO MAIN  TO AN TO MAIN  TO AN TO MAIN  TO AN T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28	21469.00 I FLOW<<<< 1.552 Fp (INCH/HR) 0.75 0.63	Ap (DECIMAL) 0.100 1.000	SCS CN 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 2  * 25 YEAR RAINFALL INT  SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL  AGRICULTURAL FAIR COVER "ORCHARDS"  PUBLIC PARK	21469.00  A TO MAIN  TO ACT  T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14	21469.00 I FLOW<><> 1.552 Fp (INCH/HR) 0.75	Ap (DECIMAL) 0.100	SCS CN 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS" PUBLIC PARK RESIDENTIAL	21469.00  A TO MAIN  TO AN TO MAIN  TO AN TO MAIN  TO AN T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28	21469.00 I FLOW<<<< 1.552 Fp (INCH/HR) 0.75 0.63	Ap (DECIMAL) 0.100 1.000	SCS CN 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS" PUBLIC PARK	21469.00  A TO MAIN  TO AN TO MAIN  TO AN	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28	21469.00 I FLOW<<<< 1.552 Fp (INCH/HR) 0.75 0.63	Ap (DECIMAL) 0.100 1.000	SCS CN 56
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS"  PUBLIC PARK RESIDENTIAL	21469.00  A TO MAIN  TO AND  T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28 6.06	21469.00 I FLOW<<<< 1.552 Fp (INCH/HR) 0.75 0.63 0.75	Ap (DECIMAL) 0.100 1.000 0.850	SCS CN 56 65 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS" PUBLIC PARK RESIDENTIAL "5-7 DWELLINGS/ACRE"	21469.00  A TO MAIN  TO AND  T	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28 6.06	21469.00 I FLOW<<<< 1.552 Fp (INCH/HR) 0.75 0.63 0.75	Ap (DECIMAL) 0.100 1.000 0.850 0.500	SCS CN 56 65 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS"  PUBLIC PARK RESIDENTIAL "5-7 DWELLINGS/ACRE" RESIDENTIAL	21469.00  A TO MAIN  E=======  27.40  PENSITY(IN  AMC II):  SCS SOIL  GROUP  B  B  B  B	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28 6.06 3.35	1.552 Fp (INCH/HR) 0.75 0.63 0.75 0.75	Ap (DECIMAL) 0.100 1.000 0.850 0.500	SCS CN 56 65 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS"  PUBLIC PARK RESIDENTIAL "5-7 DWELLINGS/ACRE"  RESIDENTIAL "3-4 DWELLINGS/ACRE"	21469.00  A TO MAIN  E=======  27.40  PENSITY(IN  AMC II):  SCS SOIL  GROUP  B  B  B  B	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28 6.06 3.35	1.552 Fp (INCH/HR) 0.75 0.63 0.75 0.75	Ap (DECIMAL) 0.100 1.000 0.850 0.500	SCS CN 56 65 56
FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 2  * 25 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE  COMMERCIAL AGRICULTURAL FAIR COVER "ORCHARDS"  PUBLIC PARK RESIDENTIAL "5-7 DWELLINGS/ACRE"  RESIDENTIAL "3-4 DWELLINGS/ACRE"	21469.00  A TO MAIN  E========  27.40  PENSITY(IN  AMC II):  SCS SOIL  GROUP  B  B  B  B  B	TO NODE LINE PEAK CH/HR) = AREA (ACRES) 8.14 7.28 6.06 3.35 0.97	21469.00 I FLOW<><<<  1.552 Fp (INCH/HR) 0.75 0.63 0.75 0.75	Ap (DECIMAL) 0.100 1.000 0.850 0.500 0.600	SCS CN 56 65 56

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 26.03 SUBAREA RUNOFF (CFS) = 26.57
 EFFECTIVE AREA(ACRES) = 101.28 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 101.3
                               PEAK FLOW RATE (CFS) = 106.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
********************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.40
 RAINFALL INTENSITY (INCH/HR) = 1.55
 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp(INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) = 101.28
 TOTAL STREAM AREA(ACRES) = 101.28
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 106.40
 ** CONFLUENCE DATA **
                      AREA HEADWATER
 STREAM O
                 Tc
 NUMBER (CFS) (MIN.) (ACRES)
                                NODE
  1 5890.18 62.89 14163.99 20120.00
   2 106.40 27.40 101.28 21460.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.36;24H= 5.02
 S-GRAPH: VALLEY(DEV.) = 77.5%; VALLEY(UNDEV.) / DESERT = 22.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.05; LAG(HR) = 0.84; Fm(INCH/HR) = 0.47; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14265.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0251; Lca/L=0.4,n=.0225; Lca/L=0.5,n=.0206; Lca/L=0.6,n=.0193
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2913.78
 PEAK FLOW RATE(CFS) = 5728.70
   (UPSTREAM NODE PEAK FLOW RATE(CFS) = 5890.18)
 PEAK FLOW RATE (CFS) USED = 5890.18
******************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21470.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1117.00 DOWNSTREAM(FEET) = 1110.00
```

B 0.23 0.75 0.900 56

".4 DWELLING/ACRE"

File name: LR0214ZZ.RES

Page 44

Date: 04/21/2014

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 370.28 CHANNEL SLOPE = 0.0189
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 5890.18
 FLOW VELOCITY (FEET/SEC.) = 33.34 FLOW DEPTH (FEET) = 5.39
 TRAVEL TIME (MIN.) = 0.19 Tc (MIN.) = 63.07
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21470.00 = 55971.39 FEET.
*******************
 FLOW PROCESS FROM NODE 21470.00 TO NODE 21471.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 63.07
 * 25 YEAR RAINFALL INTENSITY (INCH/HR) = 0.941
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                             Αp
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   В 17.62
                                     0.75
                                             0.500 56
                      В
                             0.37
                                     0.75
                                            0.100 56
 COMMERCIAL
 PUBLIC PARK
                      В
                             0.37
                                     0.75
                                             0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.499
 SUBAREA AREA(ACRES) = 18.36
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.37;30M= 0.76;1H= 1.00;3H= 1.70;6H= 2.36;24H= 5.02
 S-GRAPH: VALLEY(DEV.) = 77.5%; VALLEY(UNDEV.)/DESERT= 22.5%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.05; LAG(HR) = 0.84; Fm(INCH/HR) = 0.47; Ybar = 0.51
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14283.6
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21471.00 = 55971.39 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0250; Lca/L=0.4,n=.0224; Lca/L=0.5,n=.0206; Lca/L=0.6,n=.0192
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2916.88
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 5742.17
 TOTAL AREA(ACRES) = 14283.6
                            PEAK FLOW RATE (CFS) = 5890.18
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87
*******************
 FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 21470.DNA
_____
 END OF STUDY SUMMARY:
                = 14283.6 TC(MIN.) =
 TOTAL AREA (ACRES)
                                          63.07
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.51
 PEAK FLOW RATE (CFS) = 5890.18
_____
```

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0214ZZ.RES Page 45 Date: 04/21/2014 File name: LR0214ZZ.RES Page 46

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* RATIONAL METHOD HYDROLOGY - TO NODE 20151

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0201ZZ.DAT

TIME/DATE OF STUDY: 08:20 10/22/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000

USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.8500

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSEALL. CURR GUTTER-GEOMETRIES. MANNING

	DALL-	CROWN 10	SIKEEI-CKOSSFALL:	CUKD	GOIIEK-	-GEOMETI	ZIED:	MAININING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR	
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====	=======	=======================================	=====	=====	=====	=====	======	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20100.00 TO NODE 20101.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 219.52 ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2385.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 6.474 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.233 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE NATURAL FAIR COVER "OPEN BRUSH" B 1.33 0.61 1.000 66 10.43 NATURAL FAIR COVER "OPEN BRUSH" A 0.04 0.86 1.000 46 10.43 RESIDENTIAL 2.55 0.700 "2 DWELLINGS/ACRE" R 0.75 56 6.47 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.805 SUBAREA RUNOFF(CFS) = 9.44 TOTAL AREA (ACRES) = 3.92 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88FLOW PROCESS FROM NODE 20101.00 TO NODE 20102.00 IS CODE = 63 \_\_\_\_\_\_

\_\_\_\_\_ UPSTREAM ELEVATION (FEET) = 2385.00 DOWNSTREAM ELEVATION (FEET) = 2340.00

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014

File name: LR0201ZZ.RES

Page 1

```
STREET LENGTH (FEET) = 138.73 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.41
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 14.37
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.45
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.08
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.51
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.51
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 7.51
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.959
   STREET FLOW DEPTH (FEET) = 0.29
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 8.04
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.49
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.72
                                                                                  NATURAL FAIR COVER
 STREET FLOW TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 6.72
                                                                                  "OPEN BRUSH"
                                                                                                       A 1.17
                                                                                                                         0.86
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.162
                                                                                  NATURAL FAIR COVER
                                                                                                       B 2.63 0.61 1.000
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "OPEN BRUSH"
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                  RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  "2 DWELLINGS/ACRE" B 3.01
                                                                                                                         0.75 0.700
 NATURAL FAIR COVER
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
                      A 0.45
 "OPEN BRUSH"
                                         0.86
                                               1.000 46
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.867
                                                                                  SUBAREA AREA (ACRES) = 6.81 SUBAREA RUNOFF (CFS) = 14.36
 NATURAL FAIR COVER
                      В 0.90
 "OPEN BRUSH"
                                         0.61
                                                1.000
                                                       66
                                                                                  EFFECTIVE AREA(ACRES) = 15.09 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.83
 RESIDENTIAL
                      B 3.01 0.75 0.700 56
                                                                                  TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.793
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 4.36 SUBAREA RUNOFF(CFS) = 10.14
                                                                                  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
 EFFECTIVE AREA(ACRES) = 8.28 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.80
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 8.3 PEAK FLOW RATE (CFS) = 19.33
                                                                                  DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.54
                                                                                  FLOW VELOCITY (FEET/SEC.) = 6.35 DEPTH*VELOCITY (FT*FT/SEC.) = 2.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20103.00 = 645.52 FEET.
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
                                                                                ***********************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  FLOW PROCESS FROM NODE 20103.00 TO NODE 20104.00 IS CODE = 63
 DEPTH(FEET) = 0.31 HALFSTREET FLOOD WIDTH(FEET) = 9.13
 FLOW VELOCITY (FEET/SEC.) = 10.15 DEPTH*VELOCITY (FT*FT/SEC.) = 3.14
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20102.00 = 358.25 FEET.
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                ______
*******************
                                                                                  UPSTREAM ELEVATION(FEET) = 2320.00 DOWNSTREAM ELEVATION(FEET) = 2310.00
 FLOW PROCESS FROM NODE 20102.00 TO NODE 20103.00 IS CODE = 63
                                                                                  STREET LENGTH (FEET) = 249.70 CURB HEIGHT (INCHES) = 6.0
______
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2340.00 DOWNSTREAM ELEVATION(FEET) = 2320.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 287.27 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
```

Page 3

Date: 04/21/2014 File name: LR0201ZZ.RES

Date: 04/21/2014 File name: LR0201ZZ.RES Page 4

26.52

1.000

46

66

32.17

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
                                                                                       ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.56
                                                                                       STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 20.76
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 26.56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.43
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.57
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.07
 STREET FLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 8.15
                                                                                      STREET FLOW TRAVEL TIME (MIN.) = 1.38 Tc (MIN.) = 9.53
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.815
                                                                                      * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.563
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                      SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                      DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                                                                                                                                               SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                          LAND USE
                                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                                      NATURAL FAIR COVER
 "OPEN BRUSH"
                       A
                               1.82
                                           0.86
                                                   1.000
                                                         46
                                                                                      "OPEN BRUSH"
                                                                                                            A
                                                                                                                      5.68
                                                                                                                                0.86
                                                                                                                                       1.000
                                                                                                                                                46
 NATURAL FAIR COVER
                                                                                      RESIDENTIAL
 "OPEN BRUSH"
                        В 19.46
                                           0.61
                                                   1.000
                                                                                      "2 DWELLINGS/ACRE"
                                                                                                            A 3.92
                                                                                                                               0.98
                                                                                                                                        0.700
                                                                                                                                                32
                                                          66
 RESIDENTIAL
                                                                                      RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В 6.79
                                           0.75
                                                   0.700
                                                                                      "2 DWELLINGS/ACRE"
                                                                                                                      6.10
                                                                                                                               0.75
                                                                                                                                        0.700
                                                                                                                                                56
 RESIDENTIAL
                                                                                      NATURAL FAIR COVER
 "2 DWELLINGS/ACRE"
                                 0.01
                                           0.98
                                                 0.700 32
                                                                                      "OPEN BRUSH"
                                                                                                              В
                                                                                                                     39.60
                                                                                                                               0.61
                                                                                                                                     1.000
                       A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
                                                                                      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927
 SUBAREA AREA(ACRES) = 28.08 SUBAREA RUNOFF(CFS) = 55.78
                                                                                      SUBAREA AREA(ACRES) = 55.30 SUBAREA RUNOFF(CFS) = 96.02
 EFFECTIVE AREA(ACRES) = 43.17 AREA-AVERAGED Fm(INCH/HR) = 0.60
                                                                                      EFFECTIVE AREA(ACRES) = 98.47 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89
                                                                                      AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.92
                                                                                      TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) = 172.24
 TOTAL AREA (ACRES) = 43.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
                                                                                      5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                      END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.69
                                                                                      DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.24
 FLOW VELOCITY (FEET/SEC.) = 7.19 DEPTH*VELOCITY (FT*FT/SEC.) = 4.42
                                                                                      FLOW VELOCITY (FEET/SEC.) = 9.66 DEPTH*VELOCITY (FT*FT/SEC.) = 7.00
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 249.7 FT WITH ELEVATION-DROP = 10.0 FT, IS 58.9 CFS,
                                                                                      *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20104.00
                                                                                            THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20104.00 = 895.22 FEET.
                                                                                      SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                      ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
*********************
                                                                                      ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 FLOW PROCESS FROM NODE 20104.00 TO NODE 20105.00 IS CODE = 63
                                                                                      ASSUME FULL-FLOWING PIPELINE
                                                                                      PIPE-FLOW VELOCITY(FEET/SEC.) = 15.34
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                      PIPE-FLOW(CFS) =
                                                                                                        48.24
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.81 Tc (MIN.) = 8.96
______
                                                                                      * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.659
 UPSTREAM ELEVATION(FEET) = 2310.00 DOWNSTREAM ELEVATION(FEET) = 2270.00
                                                                                      SUBAREA AREA(ACRES) = 55.30 SUBAREA RUNOFF(CFS) = 100.80
 STREET LENGTH (FEET) = 747.57 CURB HEIGHT (INCHES) = 6.0
                                                                                      TOTAL AREA(ACRES) = 98.5
                                                                                                                      PEAK FLOW RATE(CFS) = 180.74
 STREET HALFWIDTH (FEET) = 18.00
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                      5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                      STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 132.51
                                                                                       ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                       STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                       STREET FLOW DEPTH (FEET) = 0.67
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                       HALFSTREET FLOOD WIDTH (FEET) = 26.43
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                       AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.01
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.69
                                                                                       PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.02
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 5 Date: 04/21/2014 File name: LR0201ZZ.RES Page 6

```
LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20105.00 = 1642.79 FEET.
                                                                         LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20107.00 = 4211.69 FEET.
********************
                                                                       ******************
 FLOW PROCESS FROM NODE 20105.00 TO NODE 20106.00 IS CODE = 54
                                                                         FLOW PROCESS FROM NODE 20107.00 TO NODE 20107.00 IS CODE = 81
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
                                                                         MAINLINE Tc(MIN.) = 13.44
 ELEVATION DATA: UPSTREAM(FEET) = 2270.00 DOWNSTREAM(FEET) = 2230.00
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.085
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1238.14 CHANNEL SLOPE = 0.0323
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         DEVELOPMENT TYPE/
                                                                                          SCS SOIL AREA
                                                                                                         Fp
                                                                                                               Ap
                                                                                                                         SCS
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.30
                                                                            LAND USE
 CHANNEL FLOW THRU SUBAREA(CFS) = 180.74
                                                                         NATURAL FAIR COVER
 FLOW VELOCITY (FEET/SEC.) = 9.30 FLOW DEPTH (FEET) = 2.11
                                                                         "OPEN BRUSH"
                                                                                                2.55
                                                                                                            0.86
                                                                                                                   1.000
                                                                                                                          46
 TRAVEL TIME (MIN.) = 2.22 Tc (MIN.) = 11.18
                                                                         RESIDENTIAL
                                                                                           A 12.67
                                                                                                            0.98
                                                                                                                   0.700
                                                                                                                          32
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20106.00 = 2880.93 FEET.
                                                                         "2 DWELLINGS/ACRE"
                                                                         RESIDENTIAL
"2 DWELLINGS/ACRE"
                                                                                                   10.30
                                                                                                            0.75
                                                                                                                   0.700
                                                                                                                          56
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20106.00 IS CODE = 81
                                                                         NATURAL FAIR COVER
                                                                         "OPEN BRUSH"
______
                                                                                                    66.90
                                                                                                            0.61 1.000
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.925
 MAINLINE Tc(MIN.) = 11.18
                                                                         SUBAREA AREA(ACRES) = 92.42
                                                                                                    SUBAREA RUNOFF(CFS) = 121.88
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.329
                                                                         EFFECTIVE AREA(ACRES) = 349.72 AREA-AVERAGED Fm(INCH/HR) = 0.61
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.93
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fр
                                            Ар
                                                 SCS
                                                                         TOTAL AREA (ACRES) = 349.7 PEAK FLOW RATE (CFS) = 462.81
     LAND HSE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                           1.000
 "OPEN BRUSH"
                           2.42
                                                                         5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
                    A
                                    0.86
                                                 46
 RESIDENTIAL
                                                                       ******************
                            7.44
 "2 DWELLINGS/ACRE"
                                    0.98
                                           0.700
                                                  32
 RESIDENTIAL
                                                                         FLOW PROCESS FROM NODE 20107.00 TO NODE 20108.00 IS CODE = 54
 "2 DWELLINGS/ACRE"
                            21.25
                                    0.75
                                           0.700
                                                                       ______
 NATURAL FAIR COVER
                                                                        >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "OPEN BRUSH"
                         127.72
                                    0.61 1.000
                      В
                                                                        >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
                                                                       _____
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.946
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2095.00
 SUBAREA AREA(ACRES) = 158.83 SUBAREA RUNOFF(CFS) = 245.88
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 1995.70 CHANNEL SLOPE = 0.0376
 EFFECTIVE AREA(ACRES) = 257.30 AREA-AVERAGED Fm(INCH/HR) = 0.61
                                                                         CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.94
                                                                        MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
 TOTAL AREA (ACRES) = 257.3 PEAK FLOW RATE (CFS) = 397.33
                                                                         CHANNEL FLOW THRU SUBAREA (CFS) = 462.81
                                                                         FLOW VELOCITY (FEET/SEC.) = 9.80 FLOW DEPTH (FEET) = 1.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         TRAVEL TIME (MIN.) = 3.40 Tc (MIN.) = 16.84
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
                                                                         LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20108.00 = 6207.39 FEET.
*********************
                                                                       *******************
 FLOW PROCESS FROM NODE 20106.00 TO NODE 20107.00 IS CODE = 54
                                                                         FLOW PROCESS FROM NODE 20108.00 TO NODE 20108.00 IS CODE = 81
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                       _____
                                                                         MAINLINE Tc (MIN.) = 16.84
______
 ELEVATION DATA: UPSTREAM(FEET) = 2230.00 DOWNSTREAM(FEET) = 2170.00
                                                                         * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.822
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1330.76 CHANNEL SLOPE = 0.0451
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
                                                                         DEVELOPMENT TYPE/
                                                                                           SCS SOIL AREA
                                                                                                         Fр
                                                                                                                  Aр
                                                                                                                         SCS
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 10.00
                                                                            LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL FLOW THRU SUBAREA(CFS) = 397.33
                                                                         NATURAL FAIR COVER
 FLOW VELOCITY (FEET/SEC.) = 9.81 FLOW DEPTH (FEET) = 1.25
                                                                         "OPEN BRUSH"
                                                                                            A
                                                                                                  3.92 0.86
                                                                                                                 1.000
                                                                                                                         46
 TRAVEL TIME (MIN.) = 2.26 Tc (MIN.) = 13.44
                                                                         RESIDENTIAL
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 7

File name: LR0201ZZ.RES

Date: 04/21/2014

Page 8

"2 DWELLINGS/ACRE"	A	0.86	0.98	0.700	32	TOTAL AREA(ACRES) = 690.1 PEAK FLO
RESIDENTIAL	3	1.6 0.5	0 00	0 600	20	CUDADEA ADEA AUEDACED DATMEATI DEDEU/INCH)
3-4 DWELLINGS/ACRE" OBILE HOME PARK	A	16.85	0.98	0.600	32	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
	В	25.39	0.75	0.250	56	5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57
DENTIAL DWELLINGS/ACRE"	D.	10 75	0.75	0 600	56	******************
	В	10.75	0.75	0.600	36	
FAIR COVER	-	07.64	0 61	1 000		FLOW PROCESS FROM NODE 20109.00 TO NODE 201
USH"			0.61		66	
AVERAGE PERVIO				.6/		>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT
AVERAGE PERVIO				1.00	0.4	>>>>USING TIME-OF-CONCENTRATION OF LONGEST F
CA AREA (ACRES) =			,	•		
E AREA (ACRES)					= 0.59	UNIT-HYDROGRAPH DATA:
RAGED Fp(INCH,					E40 70	RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3
(ACRES) =	495.1	PEAK F	LOW RATE (	JFS) =	348.79	S-GRAPH: VALLEY (DEV.) = 32.0%; VALLEY (UNDEV.) /D
AREA-AVERAGED 31; 30M = 0.64	; 1HR = 0.85;	3HR = 1.	57; 6HR =	******	*****	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESE  Tc(HR) = 0.34; LAG(HR) = 0.27; Fm(INCH/HR) =  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1H  3HR = 1.00; 6HR = 1.00; 24HR= 1.00
PROCESS FROM NODE	E 20108.00 1	O NODE 2	0109.00 IS	S CODE =	54	UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES
						LONGEST FLOWPATH FROM NODE 20100.00 TO NODE
>COMPUTE TRAPEZOII						EQUIVALENT BASIN FACTOR APPROXIMATIONS:
>TRAVELTIME THRU S	,		,			Lca/L=0.3, n=.0363; Lca/L=0.4, n=.0325; Lca/L=
						TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME( UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =
ATION DATA: UPSTRI IEL LENGTH THRU SU						TOTAL PEAK FLOW RATE(CFS) = 639.40 (SOURCE
NNEL BASE(FEET) =				51016 -	0.03/1	RATIONAL METHOD PEAK FLOW RATE(CFS) = 644.
IING'S FACTOR = 0.0				0.0		(UPSTREAM NODE PEAK FLOW RATE (CFS) = 644.
NNEL FLOW THRU SUB				.00		PEAK FLOW RATE (CFS) USED = 644.98
OW VELOCITY (FEET/SEC				= 1 35		THAN THOW WITH (CLO) ODED 011.50
VEL TIME (MIN.) =				1.00		******************
EST FLOWPATH FROM				00 = 82	31.30 FEET.	FLOW PROCESS FROM NODE 20109.00 TO NODE 201
**************************************	E 20109.00 1	O NODE 2	0109.00 IS	CODE =	81	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMEN
>>>ADDITION OF SUBAR	REA TO MAINL	INE PEAK F	LOW<<<<			ELEVATION DATA: UPSTREAM(FEET) = 2020.00 D
======================================						
10 YEAR RAINFALL II AREA LOSS RATE DATA VELOPMENT TYPE/	NTENSITY(INCH A(AMC II): SCS SOIL	H/HR) = 1 AREA	.624 Fp	Ар	SCS	CHANNEL LENGTH THRU SUBAREA (FEET) = 1927.24  CHANNEL BASE (FEET) = 10.00 "Z" FACTOR =  MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET  CHANNEL FLOW THRU SUBAREA (CFS) = 644.98  FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT
0 YEAR RAINFALL II REA LOSS RATE DATA ELOPMENT TYPE/	NTENSITY(INCH A(AMC II):	H/HR) = 1 AREA	.624 Fp	Ар	SCS	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98
10 YEAR RAINFALL II AREA LOSS RATE DATZ VELOPMENT TYPE/ LAND USE JRAL FAIR COVER	NTENSITY(INCH A(AMC II): SCS SOIL GROUP	AREA (ACRES) (	.624 Fp INCH/HR)	Ap (DECIMAL)	SCS	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR =  MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET  CHANNEL FLOW THRU SUBAREA (CFS) = 644.98  FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT
O YEAR RAINFALL II AREA LOSS RATE DATA VELOPMENT TYPE/ LAND USE URAL FAIR COVER	NTENSITY(INCH A(AMC II): SCS SOIL GROUP	AREA (ACRES) (	.624 Fp INCH/HR)	Ap (DECIMAL)	SCS	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21.
O YEAR RAINFALL IN AREA LOSS RATE DATA VELOPMENT TYPE/ LAND USE URAL FAIR COVER IN BRUSH"	NTENSITY(INCH A(AMC II): SCS SOIL GROUP	AREA (ACRES) (	.624 Fp INCH/HR)	Ap (DECIMAL)	SCS CN	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE
LO YEAR RAINFALL II AREA LOSS RATE DATA /ELOPMENT TYPE/ LAND USE JRAL FAIR COVER EN BRUSH" LOENTIAL	NTENSITY(INCH A(AMC II): SCS SOIL GROUP	AREA (ACRES) (	.624 Fp INCH/HR)	Ap (DECIMAL)	SCS CN	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE
LO YEAR RAINFALL IN AREA LOSS RATE DATA /ELOPMENT TYPE/ LAND USE JRAL FAIR COVER EN BRUSH" IDENTIAL 1 DWELLINGS/ACRE"	NTENSITY(INCE A(AMC II): SCS SOIL GROUP	AREA (ACRES) (	.624 Fp INCH/HR) 0.86	Ap (DECIMAL)	SCS CN 46	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE
10 YEAR RAINFALL II AREA LOSS RATE DATA VELOPMENT TYPE/ LAND USE URAL FAIR COVER EN BRUSH" IDENTIAL 4 DWELLINGS/ACRE" IDENTIAL	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A	AREA (ACRES) (	.624 Fp INCH/HR) 0.86	Ap (DECIMAL)	SCS CN 46	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL IN CAREA LOSS RATE DATA EVELOPMENT TYPE/ LAND USE EVERAL FAIR COVER PEN BRUSH" EIDENTIAL 4 DWELLINGS/ACRE" EIDENTIAL 4 DWELLINGS/ACRE"	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A	AREA (ACRES) ( 2.81 27.06	Fp INCH/HR) 0.86 0.98	Ap (DECIMAL) 1.000 0.600	SCS CN 46 32	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL INBAREA LOSS RATE DATA EVELOPMENT TYPE/ LAND USE TURAL FAIR COVER PEN BRUSH" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B	AREA (ACRES) ( 2.81 27.06	.624  Fp INCH/HR)  0.86  0.98  0.75	Ap (DECIMAL) 1.000 0.600	SCS CN 46 32	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL II BAREA LOSS RATE DATA EVELOPMENT TYPE/ LAND USE TURAL FAIR COVER PEN BRUSH" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL DWELLINGS/ACRE"	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B	AREA (ACRES) ( 2.81 27.06 26.94	Fp INCH/HR) 0.86 0.98 0.75	Ap (DECIMAL) 1.000 0.600 0.600	SCS CN 46 32 56	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL IN JEAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE ATURAL FAIR COVER DPEN BRUSH" CSIDENTIAL 3-4 DWELLINGS/ACRE" CSIDENTIAL 3-4 DWELLINGS/ACRE" CSIDENTIAL 3-4 DWELLINGS/ACRE" CSIDENTIAL 4 DWELLINGS/ACRE" CSIDENTIAL 5 DWELLINGS/ACRE" CSIDENTIAL 6 DWELLINGS/ACRE" CSIDENTIAL 6 DWELLINGS/ACRE" CSIDENTIAL 7 DWELLINGS/ACRE	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B	AREA (ACRES) ( 2.81 27.06 26.94	Fp INCH/HR) 0.86 0.98 0.75	Ap (DECIMAL) 1.000 0.600 0.600 0.700	SCS CN 46 32 56	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL IN JBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE ATURAL FAIR COVER	NTENSITY (INCE	AREA (ACRES) ( 2.81 27.06 26.94 35.77 102.40	.624  Fp INCH/HR)  0.86  0.98  0.75  0.75  0.61	Ap (DECIMAL) 1.000 0.600 0.600 0.700 1.000	SCS CN 46 32 56	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 TC (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL IN BAREA LOSS RATE DATA BEVELOPMENT TYPE/ LAND USE .TURAL FAIR COVER DEN BRUSH" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL DWELLINGS/ACRE" LURAL FAIR COVER DEN BRUSH"	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B B B OUS LOSS RATE	AREA (ACRES) ( 2.81 27.06 26.94 35.77 102.40 2, Fp(INCH	.624  Fp INCH/HR)  0.86  0.98  0.75  0.75  0.61 /HR) = 0	Ap (DECIMAL) 1.000 0.600 0.600 0.700 1.000	SCS CN 46 32 56	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 TC (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
10 YEAR RAINFALL II BAREA LOSS RATE DATE EVELOPMENT TYPE/ LAND USE TURAL FAIR COVER PEN BRUSH" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL -4 DWELLINGS/ACRE" SIDENTIAL DWELLINGS/ACRE" TURAL FAIR COVER PEN BRUSH" BAREA AVERAGE PERVIO	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B B B OUS LOSS RATE OUS AREA FRAC	A/HR) = 1  AREA (ACRES) (  2.81  27.06  26.94  35.77  102.40  E. Fp (INCH	.624  Fp INCH/HR)  0.86  0.98  0.75  0.75  0.61 /HR) = 0 = 0.834	Ap (DECIMAL) 1.000 0.600 0.600 0.700 1.000 69	SCS CN 46 32 56 56	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
O YEAR RAINFALL IN AREA LOSS RATE DATA VELOPMENT TYPE/ LAND USE URAL FAIR COVER UN BRUSH" DENTIAL UN DELLINGS/ACRE" DENTIAL UN DELLINGS/ACRE" UN DELLINGS/ACRE" UN DELLINGS/ACRE" UN DELLINGS/ACRE" UN DELLINGS/ACRE" UN DENTIAL UN DELLINGS/ACRE	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B B B OUS LOSS RATE OUS AREA FRAC	A/HR) = 1  AREA (ACRES) (  2.81  27.06  26.94  35.77  102.40  2, Fp (INCH CTION, Ap SUBAREA	.624  Fp INCH/HR)  0.86  0.98  0.75  0.75  0.61 /HR) = 0 = 0.834  RUNOFF (CFS	Ap (DECIMAL)  1.000  0.600  0.700  1.000  69  8) = 184.	SCS CN 46 32 56 56 66	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
EAR RAINFALL II LOSS RATE DATE PMENT TYPE/ ND USE FAIR COVER RUSH" FIAL ELLINGS/ACRE" FIAL LINGS/ACRE" FAIR COVER RUSH" FAIR COVER RUSH" AVERAGE PERVIC AREA (ACRES) = JE AREA (ACRES)	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B B OUS LOSS RATE OUS AREA FRACE 194.98 = 690.11	A/HR) = 1  AREA (ACRES) (  2.81  27.06  26.94  35.77  102.40  E, Fp(INCH CTION, Ap SUBAREA AREA-AV	.624  Fp INCH/HR)  0.86  0.98  0.75  0.61 /HR) = 0.61 /HR) = 0.834 RUNOFF(CFS ERAGED FM	Ap (DECIMAL)  1.000  0.600  0.700  1.000  69  3) = 184. (INCH/HR)	SCS CN 46 32 56 56 66	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
INFALL INFALL INFALL INFALL INFALL INFALL INFALE IN	NTENSITY (INCE A (AMC II): SCS SOIL GROUP A A B B OUS LOSS RATE OUS AREA FRACE 194.98 = 690.11	A/HR) = 1  AREA (ACRES) (  2.81  27.06  26.94  35.77  102.40  E, Fp(INCH CTION, Ap SUBAREA AREA-AV	.624  Fp INCH/HR)  0.86  0.98  0.75  0.61 /HR) = 0.61 /HR) = 0.834 RUNOFF(CFS ERAGED FM	Ap (DECIMAL)  1.000  0.600  0.700  1.000  69  3) = 184. (INCH/HR)	SCS CN 46 32 56 56 66	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************
CAR RAINFALL IN LOSS RATE DATE MENT TYPE/ ID USE FAIR COVER RUSH" CILLINGS/ACRE" CIAL LINGS/ACRE" LILINGS/ACRE" FAIR COVER RUSH" AVERAGE PERVIC AVERAGE PERVIC AREA(ACRES) =	NTENSITY (INCE A (AMC II): SCS SOIL GROUP  A A B B OUS LOSS RATE OUS AREA FRAC 194.98 = 690.11 /HR) = 0.67	A/HR) = 1  AREA (ACRES) (  2.81  27.06  26.94  35.77  102.40  E, Fp(INCH CTION, Ap SUBAREA AREA-AV	Fp INCH/HR)  0.86  0.98  0.75  0.61 /HR) = 0. = 0.834 RUNOFF(CFS ERAGED FM RAGED AP =	Ap (DECIMAL)  1.000  0.600  0.700  1.000  69  3) = 184. (INCH/HR)	SCS CN 46 32 56 56 66	CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET CHANNEL FLOW THRU SUBAREA (CFS) = 644.98 FLOW VELOCITY (FEET/SEC.) = 22.79 FLOW DEPT TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 21. LONGEST FLOWPATH FROM NODE 20100.00 TO NODE  ***********************************

= 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88\*\*\*\*\*\*\*\*\*\*\* 09.00 TO NODE 20109.00 IS CODE = 71 \_\_\_\_\_ OR CHANGED TO UNIT-HYDROGRAPH METHOD << < < ATION OF LONGEST FLOWPATH< \_\_\_\_\_ M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88 %; VALLEY (UNDEV.) / DESERT= 68.0% OTHILL= 0.0%; DESERT (UNDEV.) = 0.0% 27; Fm(INCH/HR) = 0.59; Ybar = 0.63A CURVES WITH AMC II CONDITION. 97; 30M = 0.97; 1HR = 0.97;R = 1.00TOTAL AREA(ACRES) = 690.1 20100.00 TO NODE 20109.00 = 8231.30 FEET. PROXIMATIONS: .4, n=.0325; Lca/L=0.5, n=.0299; Lca/L=0.6, n=.0279 33 RUNOFF VOLUME (AF) = 114.94FLOW RATE (CFS) = 639.40639.40 (SOURCE FLOW INCLUDED) ATE (CFS) = 644.98 ATE(CFS) = 644.98644.98 \*\*\*\*\*\*\*\*\*\*\* 09.00 TO NODE 20110.00 IS CODE = 54 \_\_\_\_\_ ANNEL FLOW< A (EXISTING ELEMENT) <> \_\_\_\_\_ ET) = 2020.00 DOWNSTREAM(FEET) = 1960.00 (FEET) = 1927.24 CHANNEL SLOPE = 0.0311 0 "Z" FACTOR = 2.000 MAXIMUM DEPTH(FEET) = 5.00FS) = 644.9822.79 FLOW DEPTH (FEET) = 2.02Tc(MIN.) = 21.8020100.00 TO NODE 20110.00 = 10158.54 FEET. \*\*\*\*\*\*\*\*\*\*\* 10.00 TO NODE 20110.00 IS CODE = 81 \_\_\_\_\_ MAINLINE PEAK FLOW< \_\_\_\_\_ TY(INCH/HR) = 1.560II): SOIL AREA Fp Ар SCS OUP (ACRES) (INCH/HR) (DECIMAL) CN 5.83 0.86 1.000 46 File name: LR0201ZZ.RES Page 10

PEAK FLOW RATE(CFS) =

644.98

"3-4 DWELLINGS/ACRE"	A	33.80	0.98	0.600	32	RESIDENTIAL		21 56	0.75	0.600	F.C.
RESIDENTIAL "3-4 DWELLINGS/ACRE"	В	25.19	0.75	0.600	56	"3-4 DWELLINGS/ACRE"	В	31.56	0.75	0.600	56
	В	23.19	0.75	0.600	30	NATURAL FAIR COVER	D	A1 70	0.61	1.000	66
RESIDENTIAL "2 DWELLINGS/ACRE"	В	9.84	0.75	0.700	56	"OPEN BRUSH" RESIDENTIAL	В	41.72	0.01	1.000	00
	В	9.84	0.75	0.700	56		_	F 0.6	0.75	0 000	F.C.
NATURAL FAIR COVER	_	45.00	0 61	1 000		".4 DWELLING/ACRE"		5.26	0.75	0.900	56
"OPEN BRUSH"	В	45.99	0.61	1.000	66	SUBAREA AVERAGE PERVIOU		, .		. /6	
SUBAREA AVERAGE PERVIO				.74		SUBAREA AVERAGE PERVIOU		ACTION, Ap	= 0.815		
SUBAREA AVERAGE PERVIO	US AREA FI	RACTION, Ap	= 0.780			SUBAREA AREA(ACRES) =	138.21				
SUBAREA AREA(ACRES) =	120.65					UNIT-HYDROGRAPH DATA:					
UNIT-HYDROGRAPH DATA:						RAINFALL(INCH): 5M= 0.3	1;30M= 0.6	54;1H = 0.85	5;3H = 1.57	;6H= 2.39;	24H= 4.88
RAINFALL(INCH): 5M= 0.	31;30M= 0	.64;1H= 0.85	3H = 1.57	;6H= 2.39;	24H= 4.88	S-GRAPH: VALLEY(DEV.)=	37.1%; VALI	LEY (UNDEV.)	/DESERT=	62.9%	
S-GRAPH: VALLEY(DEV.) =	35.7%; VA	LLEY (UNDEV.)	/DESERT=	64.3%		MOUNTAIN= 0.0	%;FOOTHILI	_= 0.0%; DE	ESERT (UNDE	V.)= 0.0%	
MOUNTAIN= 0.	0%;FOOTHI	LL= 0.0%;DE	SERT (UNDE	V.)= 0.09	5	Tc(HR) = 0.37; LAG(HR)	= 0.30; Fn	n(INCH/HR)	= 0.59; Y	bar = 0.64	
Tc(HR) = 0.36; LAG(HR)						USED SIERRA MADRE DEPTH					
USED SIERRA MADRE DEPT	-		•			DEPTH-AREA FACTORS: 5M					
DEPTH-AREA FACTORS: 5M						3HR = 0.99; 6HR = 1.00;	-	•	11111 0.5	·,	
3HR = 0.99; 6HR = 1.00		•	IIIK - 0.9	0,					DEC) -	949.0	
·			DEC) -	010 0		UNIT-INTERVAL (MIN) = 2					06 07 pppm
UNIT-INTERVAL (MIN) = :					I CO C 4 EEEE	LONGEST FLOWPATH FROM N			νυ ΔUIII.	00 - 110	OU.O/ FEET.
LONGEST FLOWPATH FROM			DE ZUIIU.	00 = 101	LOB.54 FEET.	EQUIVALENT BASIN FACTO			/- 0 -	0050 - '	0.6
EQUIVALENT BASIN FACT			/- o -	0000 = '		Lca/L=0.3,n=.0314; Lca					=U.6, n=.024
Lca/L=0.3,n=.0327; Lc	•				_=U.6,n=.0251	TIME OF PEAK FLOW(HR) =			. ,	158.42	
TIME OF PEAK FLOW(HR)			, ,	135.96		UNIT-HYDROGRAPH PEAK FL		•			
UNIT-HYDROGRAPH PEAK F		,				TOTAL AREA(ACRES) =	949.0	PEAK E	FLOW RATE(	CFS) =	804.42
TOTAL AREA (ACRES) =	810.8	PEAK F	LOW RATE (	CFS) =	708.25						
						SUBAREA AREA-AVERAGED R	AINFALL DE	EPTH (INCH):			
SUBAREA AREA-AVERAGED	RAINFALL I	DEPTH (INCH):				5M = 0.31; 30M = 0.64;	1HR = 0.85	3HR = 1.	.57; 6HR =	2.39; 24H	R = 4.88
5M = 0.31; 30M = 0.64;	1HR = 0.8	85; 3HR = 1.	57; 6HR =	2.39; 241	4R = 4.88						
						*******	******	*******	*****	*****	*****
*****	*****	*****	******	*****	*****	FLOW PROCESS FROM NODE	20111.00	TO NODE 2	20112.00 T	S CODE =	54
FLOW PROCESS FROM NODE	20110 00	O TO NODE 2	0111 00 т.	S CODE =	54						
						>>>>COMPUTE TRAPEZOIDA	T. CHANNET.	FI.OW<			
>>>>COMPUTE TRAPEZOID						>>>>TRAVELTIME THRU SU					
>>>>TRAVELTIME THRU S			MENTEN ////			======================================	,		,		
	•		,								
						ELEVATION DATA: UPSTREA	, ,				
ELEVATION DATA: UPSTRE	, ,			. ,		CHANNEL LENGTH THRU SUB	,			EL SLOPE =	0.0300
CHANNEL LENGTH THRU SU				EL SLOPE =	= 0.0431	CHANNEL BASE (FEET) =					
CHANNEL BASE (FEET) =						MANNING'S FACTOR = 0.01		•	,	.00	
MANNING'S FACTOR = 0.0	15 MAXII	MUM DEPTH(FE	EET) = 5	.00		CHANNEL FLOW THRU SUBAR	EA(CFS) =	804.42	2		
CHANNEL FLOW THRU SUBA	REA(CFS) =	= 708.25	5			FLOW VELOCITY (FEET/SEC.	) = 23.96	FLOW DE	EPTH (FEET)	= 2.30	
FLOW VELOCITY (FEET/SEC	.) = 26.2	26 FLOW DE	EPTH (FEET)	= 1.94		TRAVEL TIME (MIN.) = 1	.16 Tc(N	MIN.) = 2	23.55		
TRAVEL TIME(MIN.) =	0.59 Tc	(MIN.) = 2	22.39			LONGEST FLOWPATH FROM N	ODE 20100	0.00 TO NOI	DE 20112.	00 = 127	51.84 FEET.
LONGEST FLOWPATH FROM 1				00 = 110	086.87 FEET.						
				++\		*******	******	*******	*****	*****	*****
*****	*****	******	******	*****	*****	FLOW PROCESS FROM NODE	20112 00	TO NODE 3	0112 NN T	S CODE =	81
FLOW PROCESS FROM NODE	20111 00	) TO NODE 2	0111 00 T	S CODF =	81						
INCOLOG FROM NODE						>>>>ADDITION OF SUBARE					
>>>>ADDITION OF SUBAR	ידבת חר בם ידבת חר ב	UI.TNE PEAK F	 >>>>>\W\.	<b>-</b> -		======================================				========	.=========
						MAINLINE Tc(MIN.) = 2					
								מע/עי	1.400		
MAINLINE TC (MIN.) = 1		VICII / IID \ 1	E26			* 10 YEAR RAINFALL INT		.n/nk) = 1	1.430		
* 10 YEAR RAINFALL IN			3 5 0			SUBAREA LOSS RATE DATA(		10	_		222
SUBAREA LOSS RATE DATA			_	_		DEVELOPMENT TYPE/	SCS SOIL		Fp	Ap	SCS
DEVELOPMENT TYPE/		L AREA	Fp	Ap	SCS	LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
LAND USE	GROUP	(ACRES) (	(INCH/HR)	(DECIMAL)	CN	RESIDENTIAL					
NATURAL FAIR COVER						"3-4 DWELLINGS/ACRE"	A	8.51	0.98	0.600	32
"OPEN BRUSH"	A	28.59	0.86	1.000	46	RESIDENTIAL					
RESIDENTIAL						"3-4 DWELLINGS/ACRE"	В	0.54	0.75	0.600	56
"3-4 DWELLINGS/ACRE"	A	31.08	0.98	0.600	32	RESIDENTIAL	=				
0 1 DWDDD11100/1101E	11	51.00	0.50	0.000	<i>52</i>						
_					_						
Date: 04/21/2014	File na	me: LR0201ZZ.F	RES		Page 11	Date: 04/21/2014	File nam	e: LR0201ZZ.	RES		Page 12

```
".4 DWELLING/ACRE"
                      A 3.29
                                         0.98
                                                0.900
                                                        32
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                               75.85
                                         0.75
                                                0.900
                                                        56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                        В
                                7.12
                                         0.61
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.76
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.879
 SUBAREA AREA(ACRES) = 95.31
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88
 S-GRAPH: VALLEY (DEV.) = 34.6%; VALLEY (UNDEV.) / DESERT= 65.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.39; LAG(HR) = 0.31; Fm(INCH/HR) = 0.60; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 2.50 TOTAL AREA(ACRES) = 1044.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20112.00 = 12751.84 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0295; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0243; Lca/L=0.6,n=.0226
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 169.66
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 851.38
 TOTAL AREA (ACRES) = 1044.3
                                 PEAK FLOW RATE(CFS) =
                                                       851.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20112.00 TO NODE 20150.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 907.32 CHANNEL SLOPE = 0.0220
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 851.38
 FLOW VELOCITY (FEET/SEC.) = 21.84 FLOW DEPTH (FEET) = 2.57
 TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 24.24
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
*********************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 24.24
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.464
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                        Fр
                                                 Aр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                              4.19
                                         0.75
                                                0.600
                                                       56
 RESIDENTIAL
                              3.83
                                                0.900
 ".4 DWELLING/ACRE"
                        В
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743
```

```
SUBAREA AREA(ACRES) = 8.02
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88
 S-GRAPH: VALLEY(DEV.) = 34.7%; VALLEY(UNDEV.) / DESERT = 65.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.40; LAG(HR) = 0.32; Fm(INCH/HR) = 0.60; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 2.50 TOTAL AREA (ACRES) = 1052.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0286; Lca/L=0.4,n=.0256; Lca/L=0.5,n=.0236; Lca/L=0.6,n=.0220
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 172.42
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                    838.34
 TOTAL AREA (ACRES) = 1052.3
                                PEAK FLOW RATE(CFS) =
                                                      851.38
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 20120.00 TO NODE 20121.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 591.56
 ELEVATION DATA: UPSTREAM(FEET) = 3148.00 DOWNSTREAM(FEET) = 2920.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.975
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.355
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                                                Αp
                                                       SCS Tc
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                               5.75
                                       0.61 1.000
                                                       66 10.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) =
                      9.01
                   5.75 PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) =
                                                   9.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
*****************
 FLOW PROCESS FROM NODE 20121.00 TO NODE 20122.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

File name: LR0201ZZ.RES

Page 14

Date: 04/21/2014

```
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2860.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 401.18 CHANNEL SLOPE = 0.1496
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              9.01
 FLOW VELOCITY (FEET/SEC.) = 6.37 FLOW DEPTH (FEET) = 0.75
 TRAVEL TIME (MIN.) = 1.05 Tc (MIN.) = 12.03
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20122.00 = 992.74 FEET.
*******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20122.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 12.03
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.230
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                  SCS
                                          Ар
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                           6.02
                                    0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 6.02 SUBAREA RUNOFF(CFS) = 8.75
 EFFECTIVE AREA(ACRES) = 11.77 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 11.8
                           PEAK FLOW RATE(CFS) =
                                                  17.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20122.00 TO NODE 20123.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2860.00 DOWNSTREAM(FEET) = 2800.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 404.41 CHANNEL SLOPE = 0.1484
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 17.12
 FLOW VELOCITY (FEET/SEC.) = 7.45 FLOW DEPTH (FEET) = 0.96
 TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 12.93
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20123.00 = 1397.15 FEET.
******************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20123.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 12.93
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.135
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                            αA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             5.11
                                    0.61
                                           1.000 66
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 5.11
                           SUBAREA RUNOFF(CFS) = 6.99
 EFFECTIVE AREA(ACRES) = 16.88 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 16.9
                             PEAK FLOW RATE(CFS) =
                                                   23.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20123.00 TO NODE 20124.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2720.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 734.74 CHANNEL SLOPE = 0.1089
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              23.10
 FLOW VELOCITY (FEET/SEC.) = 7.12 FLOW DEPTH (FEET) = 1.14
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 14.65
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20124.00 = 2131.89 FEET.
*******************
 FLOW PROCESS FROM NODE 20124.00 TO NODE 20124.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE TC(MIN.) = 14.65
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.981
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                            33.25
                                     0.61 1.000
 "OPEN BRUSH"
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 33.25 SUBAREA RUNOFF (CFS) = 40.89
 EFFECTIVE AREA(ACRES) = 50.13 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 50.1 PEAK FLOW RATE (CFS) =
                                                 61.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20124.00 TO NODE 20125.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2720.00 DOWNSTREAM(FEET) = 2620.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 932.28 CHANNEL SLOPE = 0.1073
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 16

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61

```
FLOW VELOCITY (FEET/SEC.) = 9.05 FLOW DEPTH (FEET) = 1.65
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 16.37
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20125.00 = 3064.17 FEET.
******************
 FLOW PROCESS FROM NODE 20125.00 TO NODE 20125.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.37
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.853
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
                                            Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                            36.51 0.61 1.000 66
 "OPEN BRUSH"
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 36.51 SUBAREA RUNOFF(CFS) = 40.72
 EFFECTIVE AREA(ACRES) = 86.64 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 86.6 PEAK FLOW RATE (CFS) =
                                                    96.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
FLOW PROCESS FROM NODE 20125.00 TO NODE 20126.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2620.00 DOWNSTREAM(FEET) = 2600.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1333.93 CHANNEL SLOPE = 0.0150
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              96.63
 FLOW VELOCITY (FEET/SEC.) = 4.84 FLOW DEPTH (FEET) = 2.83
 TRAVEL TIME (MIN.) = 4.59 Tc (MIN.) = 20.96
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20126.00 = 4398.10 FEET.
******************
 FLOW PROCESS FROM NODE 20126.00 TO NODE 20126.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 20.96
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.598
 SUBAREA LOSS RATE DATA (AMC II):
                                           Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                             60.59
                                     0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 60.59
                            SUBAREA RUNOFF (CFS) = 53.64
 EFFECTIVE AREA(ACRES) = 147.23 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
```

```
TOTAL AREA(ACRES) = 147.2
                           PEAK FLOW RATE(CFS) = 130.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
FLOW PROCESS FROM NODE 20126.00 TO NODE 20127.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1404.24 CHANNEL SLOPE = 0.1282
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 130.33
 FLOW VELOCITY (FEET/SEC.) = 8.82 FLOW DEPTH (FEET) = 0.69
 TRAVEL TIME (MIN.) = 2.65 Tc (MIN.) = 23.62
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20127.00 = 5802.34 FEET.
*******************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20127.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 23.62
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.487
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fр
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                         45.37 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 45.37 SUBAREA RUNOFF (CFS) = 35.66
 EFFECTIVE AREA(ACRES) = 192.60 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA (ACRES) = 192.6 PEAK FLOW RATE (CFS) = 151.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
********************
 FLOW PROCESS FROM NODE 20127.00 TO NODE 20128.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.58 CHANNEL SLOPE = 0.1444
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 151.37
 FLOW VELOCITY (FEET/SEC.) = 8.42 FLOW DEPTH (FEET) = 0.58
 TRAVEL TIME (MIN.) = 2.47 Tc (MIN.) = 26.08
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20128.00 = 7048.92 FEET.
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 17 Date: 04/21/2014 File name: LR0201ZZ.RES Page 18

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 26.08
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.401
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fρ
                                             Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                         27.94
                                     0.61 1.000
                                                    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 8.51
                                   0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.930
 SUBAREA AREA(ACRES) = 36.45
                            SUBAREA RUNOFF (CFS) = 26.52
 EFFECTIVE AREA(ACRES) = 229.05 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.99
 TOTAL AREA (ACRES) = 229.0 PEAK FLOW RATE (CFS) = 162.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20128.00 TO NODE 20129.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2120.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1393.78 CHANNEL SLOPE = 0.0861
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 162.97
 FLOW VELOCITY (FEET/SEC.) = 7.36 FLOW DEPTH (FEET) = 0.70
 TRAVEL TIME (MIN.) = 3.16 Tc (MIN.) = 29.24
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20129.00 = 8442.70 FEET.
FLOW PROCESS FROM NODE 20129.00 TO NODE 20129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 29.24
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.308
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                           Дp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            18.57
                                            1.000
                                     0.61
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                  в 10.38
                                     0.75
                                            0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892
 SUBAREA AREA(ACRES) = 28.95
                          SUBAREA RUNOFF(CFS) = 18.94
 EFFECTIVE AREA(ACRES) = 258.00 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.62 AREA-AVERAGED Ap = 0.98
 TOTAL AREA (ACRES) =
                  258.0 PEAK FLOW RATE(CFS) =
                                                 162.97
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
FLOW PROCESS FROM NODE 10129.00 TO NODE 20130.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 1995.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2018.40 CHANNEL SLOPE = 0.0619
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           162.97
 FLOW VELOCITY (FEET/SEC.) = 6.66 FLOW DEPTH (FEET) = 0.78
 TRAVEL TIME (MIN.) = 5.05 Tc (MIN.) = 34.29
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20130.00 = 10461.10 FEET.
*************************
 FLOW PROCESS FROM NODE 20130.00 TO NODE 20130.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 34.29
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.189
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В
                           28.04
                                    0.75
                                           0.900
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 51.49
                                    0.61
                                          1.000
                                                  66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                          30.71
                                    0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 110.24
                            SUBAREA RUNOFF (CFS) = 58.07
 EFFECTIVE AREA(ACRES) = 368.24 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 368.2
                             PEAK FLOW RATE(CFS) =
                                                 193.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
*******************
 FLOW PROCESS FROM NODE 20130.00 TO NODE 20148.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1995.00 DOWNSTREAM(FEET) = 1925.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1246.14 CHANNEL SLOPE = 0.0562
 CHANNEL BASE (FEET) = 30.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 193.15
 FLOW VELOCITY (FEET/SEC.) = 6.89 FLOW DEPTH (FEET) = 0.88
      Date: 04/21/2014 File name: LR0201ZZ.RES
                                                Page 20
```

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

```
TRAVEL TIME (MIN.) = 3.01 Tc (MIN.) = 37.30
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 37.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.131
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 19.93
                                     0.75
                                             0.900
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                           0.65
                                     0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
 SUBAREA AREA(ACRES) = 20.58
                             SUBAREA RUNOFF(CFS) = 8.60
 EFFECTIVE AREA(ACRES) = 388.82 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 388.8
                            PEAK FLOW RATE(CFS) =
                                                 193.15
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 37.30
 RAINFALL INTENSITY (INCH/HR) = 1.13
 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.64
 AREA-AVERAGED Ap = 0.95
 EFFECTIVE STREAM AREA(ACRES) = 388.82
 TOTAL STREAM AREA(ACRES) = 388.82
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 193.15
******************
 FLOW PROCESS FROM NODE 20140.00 TO NODE 20141.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 823.61
 ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.588
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.169
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
      Date: 04/21/2014 File name: LR0201ZZ.RES
                                                  Page 21
```

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                             8.14
                                     0.61 1.000 66 12.59
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF(CFS) = 11.39
 TOTAL AREA (ACRES) = 8.14 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
*******************
 FLOW PROCESS FROM NODE 20141.00 TO NODE 20142.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 2690.00 DOWNSTREAM(FEET) = 2560.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 610.78 CHANNEL SLOPE = 0.2128
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 11.39
 FLOW VELOCITY (FEET/SEC.) = 7.73 FLOW DEPTH (FEET) = 0.77
 TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 13.90
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20142.00 = 1434.39 FEET.
*************************
 FLOW PROCESS FROM NODE 20142.00 TO NODE 20142.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 13.90
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.044
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     B 15.44 0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA (ACRES) = 15.44 SUBAREA RUNOFF (CFS) = 19.87
 EFFECTIVE AREA(ACRES) = 23.58 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 23.6
                              PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
FLOW PROCESS FROM NODE 20142.00 TO NODE 20143.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2560.00 DOWNSTREAM(FEET) = 2420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 771.13 CHANNEL SLOPE = 0.1816
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
```

Date: 04/21/2014

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                             30.34
 FLOW VELOCITY (FEET/SEC.) = 9.22 FLOW DEPTH (FEET) = 1.15
 TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 15.30
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20143.00 = 2205.52 FEET.
FLOW PROCESS FROM NODE 20143.00 TO NODE 20143.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 15.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.930
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          Дp
                                                 SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В 22.70
                                  0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 22.70
                            SUBAREA RUNOFF (CFS) = 26.88
 EFFECTIVE AREA(ACRES) = 46.28 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 46.3
                           PEAK FLOW RATE(CFS) =
                                                  54.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20143.00 TO NODE 20144.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2420.00 DOWNSTREAM(FEET) = 2240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1310.58 CHANNEL SLOPE = 0.1373
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            54.81
 FLOW VELOCITY (FEET/SEC.) = 9.64 FLOW DEPTH (FEET) = 1.51
 TRAVEL TIME (MIN.) = 2.27 Tc (MIN.) = 17.56
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20144.00 = 3516.10 FEET.
********************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20144.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 17.56
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                 Fρ
                                            Aр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                         61.27
                                    0.61
                                          1.000
                                                66
 RESIDENTIAL
                    В 11.25
                                           0.900
 ".4 DWELLING/ACRE"
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.984
```

```
SUBAREA AREA(ACRES) = 72.52
                             SUBAREA RUNOFF (CFS) = 75.27
 EFFECTIVE AREA(ACRES) = 118.80 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.99
 TOTAL AREA(ACRES) = 118.8
                              PEAK FLOW RATE (CFS) = 123.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20144.00 TO NODE 20145.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1185.29 CHANNEL SLOPE = 0.0759
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 123.69
 FLOW VELOCITY (FEET/SEC.) = 9.51 FLOW DEPTH (FEET) = 1.59
 TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 19.64
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20145.00 = 4701.39 FEET.
*******************
 FLOW PROCESS FROM NODE 20145.00 TO NODE 20145.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 19.64
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.661
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                  Fр
                                            Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В 27.90
                                     0.61 1.000
                                                    66
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 18.45
                                     0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.960
 SUBAREA AREA(ACRES) = 46.35
                            SUBAREA RUNOFF (CFS) = 42.70
 EFFECTIVE AREA(ACRES) = 165.15 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.98
 TOTAL AREA(ACRES) = 165.1 PEAK FLOW RATE(CFS) = 154.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20145.00 TO NODE 20146.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2065.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1106.66 CHANNEL SLOPE = 0.0768
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

Date: 04/21/2014 File name: LR0201ZZ.RES

Page 24

```
FLOW VELOCITY (FEET/SEC.) = 10.17 FLOW DEPTH (FEET) = 1.77
 TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 21.45
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20146.00 = 5808.05 FEET.
*****************
 FLOW PROCESS FROM NODE 20146.00 TO NODE 20146.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 21.45
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.575
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                Fр
                                          Ар
                                                SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                          5.66
                                   0.61
                                          1.000
                                                66
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   B 28.22 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.917
 SUBAREA AREA(ACRES) = 33.88
                         SUBAREA RUNOFF (CFS) = 27.81
 EFFECTIVE AREA(ACRES) = 199.03 AREA-AVERAGED Fm(INCH/HR) = 0.63
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.97
 TOTAL AREA (ACRES) = 199.0 PEAK FLOW RATE (CFS) = 169.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20146.00 TO NODE 20147.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2065.00 DOWNSTREAM(FEET) = 1980.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1084.55 CHANNEL SLOPE = 0.0784
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 169.13
 FLOW VELOCITY (FEET/SEC.) = 10.52 FLOW DEPTH (FEET) = 1.85
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 23.17
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20147.00 = 6892.60 FEET.
******************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20147.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 23.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.504
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                         qΑ
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   в 15.70 0.75
                                         0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA(ACRES) = 15.70
                           SUBAREA RUNOFF(CFS) = 11.74
```

```
EFFECTIVE AREA(ACRES) = 214.73 AREA-AVERAGED Fm(INCH/HR) = 0.63
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.97
 TOTAL AREA(ACRES) = 214.7
                              PEAK FLOW RATE(CFS) =
                                                  169.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20147.00 TO NODE 20148.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1925.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 934.91 CHANNEL SLOPE = 0.0588
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 169.13
 FLOW VELOCITY (FEET/SEC.) = 9.48 FLOW DEPTH (FEET) = 1.99
 TRAVEL TIME (MIN.) = 1.64 Tc (MIN.) = 24.82
 LONGEST FLOWPATH FROM NODE 20140.00 TO NODE 20148.00 = 7827.51 FEET.
*************************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 24.82
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.444
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                   Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В
                            14.97 0.75 0.900
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA(ACRES) = 14.97 SUBAREA RUNOFF(CFS) = 10.38
 EFFECTIVE AREA(ACRES) = 229.70 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.96
 TOTAL AREA(ACRES) = 229.7
                              PEAK FLOW RATE (CFS) = 169.13
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
*******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20148.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.82
 RAINFALL INTENSITY (INCH/HR) = 1.44
 AREA-AVERAGED Fm(INCH/HR) = 0.64
 AREA-AVERAGED Fp (INCH/HR) = 0.66
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 25

```
AREA-AVERAGED Ap = 0.96
 EFFECTIVE STREAM AREA(ACRES) = 229.70
 TOTAL STREAM AREA(ACRES) = 229.70
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 169.13
 ** CONFLUENCE DATA **
  STREAM
         0
               Tc Intensity Fp(Fm)
                                        Ар Ае
                                                   HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         193.15 37.30 1.131 0.64(0.61)0.95 388.8 20120.00
         169.13 24.82 1.444 0.66(0.64)0.96
                                             229.7 20140.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM
         0
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          362.28 24.82 1.444 0.65(0.62)0.95 488.4 20140.00
    2
          296.64 37.30 1.131 0.65(0.62) 0.95 618.5 20120.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 362.28 Tc (MIN.) = 24.82
 EFFECTIVE AREA(ACRES) = 488.40 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) = 618.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20148.00 = 11707.24 FEET.
******************
 FLOW PROCESS FROM NODE 20148.00 TO NODE 20149.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1925.00 DOWNSTREAM(FEET) = 1900.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 764.60 CHANNEL SLOPE = 0.0327
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 362.28
 FLOW VELOCITY (FEET/SEC.) = 9.00 FLOW DEPTH (FEET) = 2.64
 TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 26.23
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20149.00 = 12471.84 FEET.
*********************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20149.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 26.23
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.396
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fр
                                             Aр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     в 20.34
                                     0.75
                                             0.900
                                                   56
 RESIDENTIAL
                    В 0.62
 "3-4 DWELLINGS/ACRE"
                                      0.75
                                             0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.891
```

```
EFFECTIVE AREA(ACRES) = 509.36 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95
 TOTAL AREA(ACRES) = 639.5
                              PEAK FLOW RATE(CFS) =
                                                  362.28
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
*******************
 FLOW PROCESS FROM NODE 20149.00 TO NODE 20150.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1850.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1212.57 CHANNEL SLOPE = 0.0412
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              362.28
 FLOW VELOCITY (FEET/SEC.) = 9.78 FLOW DEPTH (FEET) = 2.48
 TRAVEL TIME (MIN.) = 2.07 Tc (MIN.) = 28.30
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 28.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.334
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                   SCS
                                           αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 8.58
                                     0.75
                                          0.900
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 0.10 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA AREA(ACRES) = 8.68
                          SUBAREA RUNOFF (CFS) = 5.18
 EFFECTIVE AREA(ACRES) = 518.04 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95
 TOTAL AREA (ACRES) =
                  648.2
                              PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 71
._____
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
_____
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88
 S-GRAPH: VALLEY(DEV.) = 7.9%; VALLEY(UNDEV.) / DESERT= 92.1%
```

File name: LR020177.RFS

Page 28

SUBAREA RUNOFF (CFS) = 13.77

SUBAREA AREA(ACRES) = 20.96

Date: 04/21/2014

```
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.68; LAG(HR) = 0.55; Fm(INCH/HR) = 0.62; Ybar = 0.67
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0568; Lca/L=0.4,n=.0510; Lca/L=0.5,n=.0468; Lca/L=0.6,n=.0437
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 95.27
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 341.84
 TOTAL PEAK FLOW RATE (CFS) = 341.84 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 362.28
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 362.28)
 PEAK FLOW RATE (CFS) USED = 362.28
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
                              Tc(MIN.) = 40.99
 PEAK FLOW RATE (CFS) = 362.28
 AREA-AVERAGED Fm(INCH/HR) = 0.62 Ybar = 0.67
 TOTAL AREA (ACRES) = 648.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 851.38 Tc (MIN.) = 24.24
 AREA-AVERAGED Fm(INCH/HR) = 0.60 Ybar = 0.64
 TOTAL AREA(ACRES) = 1052.3
 LONGEST FLOWPATH FROM NODE 20100.00 TO NODE 20150.00 = 13659.16 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88
 S-GRAPH: VALLEY(DEV.) = 24.5%; VALLEY(UNDEV.) / DESERT = 75.5%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.68; LAG(HR) = 0.55; Fm(INCH/HR) = 0.61; Ybar = 0.65
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1700.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20150.00 = 13684.41 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0568; Lca/L=0.4,n=.0510; Lca/L=0.5,n=.0468; Lca/L=0.6,n=.0437
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 258.60
 PEAK FLOW RATE (CFS) = 869.45
******************
 FLOW PROCESS FROM NODE 20150.00 TO NODE 20150.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<<
_____
FLOW PROCESS FROM NODE 20150.00 TO NODE 20151.00 IS CODE = 54
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1850.00 DOWNSTREAM(FEET) = 1785.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1753.77 CHANNEL SLOPE = 0.0371
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 869.45
 FLOW VELOCITY (FEET/SEC.) = 26.45 FLOW DEPTH (FEET) = 2.26
 TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 42.10
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 42.10
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.051
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 24.58 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.900
 SUBAREA AREA (ACRES) = 24.58
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.39;24H= 4.88
 S-GRAPH: VALLEY (DEV.) = 24.1%; VALLEY (UNDEV.) / DESERT= 75.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.70; LAG(HR) = 0.56; Fm(INCH/HR) = 0.61; Ybar = 0.66
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0525; Lca/L=0.4,n=.0471; Lca/L=0.5,n=.0433; Lca/L=0.6,n=.0404
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 261.61
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 867.05
 TOTAL AREA(ACRES) = 1725.0 PEAK FLOW RATE(CFS) =
                                                   869.45
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20151.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1725.0 TC (MIN.) = 42.10
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.66
```

Date: 04/21/2014 File name: LR0201ZZ.RES Page 29

File name: LR0201ZZ.RES

Page 30

Date: 04/21/2014

PEAK	FLOW	RATE	CFS	) =	869.45

\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0201ZZ.RES
 Page 31
 Date: 04/21/2014
 File name: LR0201ZZ.RES
 Page 32

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\*

\* RATIONAL METHOD HYDROLOGY - TO NODE 20274

4

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

17 20.0

\*

FILE NAME: LR0202ZZ.DAT

TIME/DATE OF STUDY: 10:05 10/22/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.9900

USER SPECIFIED STORM EVENT(YEAR) = 10.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

\*SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85
\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	RIES:	MANNING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20200.00 TO NODE 20201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 508.83 ELEVATION DATA: UPSTREAM(FEET) = 1945.00 DOWNSTREAM(FEET) = 1935.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.936 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.864 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" A 4.64 0.98 0.600 32 10.94 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA RUNOFF (CFS) = 13.69 TOTAL AREA (ACRES) = 4.64 PEAK FLOW RATE (CFS) = 13 69 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20201.00 TO NODE 20202.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1935.00 DOWNSTREAM NODE ELEVATION (FEET) = 1930.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 620.72 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700 Date: 04/21/2014 File name: LR0202ZZ.RES Page 2

10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

```
"3-4 DWELLINGS/ACRE" A 11.02 0.98 0.600 32
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.137
                                                                                MOBILE HOME PARK A 0.23 0.98 0.250 32
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.593
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA (ACRES) = 11.25 SUBAREA RUNOFF (CFS) = 24.19
     LAND USE
                                                                                EFFECTIVE AREA(ACRES) = 22.21 AREA-AVERAGED Fm(INCH/HR) = 0.58
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.32 0.98 0.600 32
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                TOTAL AREA (ACRES) = 22.2 PEAK FLOW RATE (CFS) = 47.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.95
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.18
 AVERAGE FLOW DEPTH (FEET) = 0.64 FLOOD WIDTH (FEET) = 37.43
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.25 Tc (MIN.) = 14.19
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 6.32 SUBAREA RUNOFF (CFS) = 14.52
                                                                                DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 18.84
 EFFECTIVE AREA(ACRES) = 10.96 AREA-AVERAGED Fm(INCH/HR) = 0.59
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.38 DEPTH*VELOCITY (FT*FT/SEC.) = 3.41
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
                                                                                LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20203.00 = 1499.05 FEET.
 TOTAL AREA (ACRES) = 11.0 PEAK FLOW RATE (CFS) =
                                                         25.18
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 20203.00 TO NODE 20204.00 IS CODE = 63
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                               _______
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                >>>> (STREET TABLE SECTION # 13 USED) <<<<
 DEPTH(FEET) = 0.67 FLOOD WIDTH(FEET) = 40.71
                                                                               _____
 FLOW VELOCITY (FEET/SEC.) = 3.28 DEPTH*VELOCITY (FT*FT/SEC) = 2.20
                                                                                UPSTREAM ELEVATION(FEET) = 1910.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20202.00 = 1129.55 FEET.
                                                                                STREET LENGTH (FEET) = 418.06 CURB HEIGHT (INCHES) = 8.0
                                                                                STREET HALFWIDTH (FEET) = 32.00
*****
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 FLOW PROCESS FROM NODE 20202.00 TO NODE 20203.00 IS CODE = 63
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1930.00 DOWNSTREAM ELEVATION(FEET) = 1910.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 369.50 CURB HEIGHT (INCHES) = 8.0
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 32.00
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH (FEET) = 0.61
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.59
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.83
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.55
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 16.41
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
                                                                                * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.793
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.28
                                                                                    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 6.00 0.98 0.600 32
   HALFSTREET FLOOD WIDTH (FEET) = 17.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.03
                                                                                MOBILE HOME PARK A 6.97 0.98 0.250 32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.01
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 15.21
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.968
                                                                                SUBAREA AREA (ACRES) = 12.97 SUBAREA RUNOFF (CFS) = 27.92
                                                                                EFFECTIVE AREA(ACRES) = 35.18 AREA-AVERAGED Fm(INCH/HR) = 0.52
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.53
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) = 72.13
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 3 Date: 04/21/2014 File name: LR0202ZZ.RES Page 4

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 23.99
 FLOW VELOCITY(FEET/SEC.) = 6.07 DEPTH*VELOCITY(FT*FT/SEC.) = 3.87
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20204.00 = 1917.11 FEET.
********************
 FLOW PROCESS FROM NODE 20204.00 TO NODE 20205.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1895.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 555.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.62
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.38
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.33
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 17.86
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.610
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                      SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 8.31
                                       0.98 0.600 32
 MOBILE HOME PARK A 8.55 0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.423
 SUBAREA AREA(ACRES) = 16.86 SUBAREA RUNOFF(CFS) = 33.36
 EFFECTIVE AREA(ACRES) = 52.04 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 52.0 PEAK FLOW RATE (CFS) =
                                                       99.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.97
 FLOW VELOCITY (FEET/SEC.) = 6.54 DEPTH*VELOCITY (FT*FT/SEC.) = 4.59
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20205.00 = 2472.11 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1875.00 DOWNSTREAM ELEVATION (FEET) = 1855.00
 STREET LENGTH (FEET) = 568.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 30.37
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.71
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 19.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.453
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK A 4.58 0.98 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.65 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA (ACRES) = 6.23 SUBAREA RUNOFF (CFS) = 11.88
 EFFECTIVE AREA (ACRES) = 58.27 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.48
 TOTAL AREA (ACRES) = 58.3 PEAK FLOW RATE (CFS) = 104.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 30.06
 FLOW VELOCITY (FEET/SEC.) = 6.56 DEPTH*VELOCITY (FT*FT/SEC.) = 4.68
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20206.00 = 3040.11 FEET.
*****************
 FLOW PROCESS FROM NODE 20206.00 TO NODE 20214.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1855.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
 STREET LENGTH (FEET) = 411.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
```

FLOW PROCESS FROM NODE 20205.00 TO NODE 20206.00 IS CODE = 63

Date: 04/21/2014 File name: LR0202ZZ.RES Page 5

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 106.30
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.71
   HALFSTREET FLOOD WIDTH (FEET) = 30.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.76
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 20.33
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.353
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                     A 1.68 0.98 0.250 32
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.62 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344
 SUBAREA AREA (ACRES) = 2.30 SUBAREA RUNOFF (CFS) = 4.18
 EFFECTIVE AREA(ACRES) = 60.57 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 60.6 PEAK FLOW RATE (CFS) = 104.22
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71 HALFSTREET FLOOD WIDTH(FEET) = 29.75
 FLOW VELOCITY (FEET/SEC.) = 6.64 DEPTH*VELOCITY (FT*FT/SEC.) = 4.71
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET.
*****************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 20.33
 RAINFALL INTENSITY (INCH/HR) = 2.35
 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.97
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 60.57
 TOTAL STREAM AREA(ACRES) = 60.57
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 104.22
******************
 FLOW PROCESS FROM NODE 20210.00 TO NODE 20211.00 IS CODE = 21
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 940.61
 ELEVATION DATA: UPSTREAM(FEET) = 1875.00 DOWNSTREAM(FEET) = 1850.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 13.163
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.332
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 7.95 0.98 0.600 32 13.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 19.65
 TOTAL AREA (ACRES) = 7.95 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*************************
 FLOW PROCESS FROM NODE 20211.00 TO NODE 20212.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1850.00 DOWNSTREAM ELEVATION(FEET) = 1846.00
 STREET LENGTH (FEET) = 247.17 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.78
 STREET FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 14.32
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.114
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.82 0.98
                                                0.600
                                                       32
 MOBILE HOME PARK A
                               0.55
                                        0.98
                                                0.250 32
```

Date: 04/21/2014 File name: LR0202ZZ.RES

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                    5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.564
 SUBAREA AREA(ACRES) = 5.37 SUBAREA RUNOFF(CFS) = 12.39
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 13.32 AREA-AVERAGED Fm(INCH/HR) = 0.57
                                                                                   DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.53
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.59
                                                                                   FLOW VELOCITY (FEET/SEC.) = 3.77 DEPTH*VELOCITY (FT*FT/SEC.) = 2.22
 TOTAL AREA (ACRES) = 13.3 PEAK FLOW RATE (CFS) =
                                                           30.49
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                         AND L = 253.2 FT WITH ELEVATION-DROP = 3.0 FT, IS 24.4 CFS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20213.00
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                   LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20213.00 = 1440.99 FEET.
                                                                                  ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 19.17
                                                                                    FLOW PROCESS FROM NODE 20213.00 TO NODE 20214.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 3.77 DEPTH*VELOCITY (FT*FT/SEC.) = 1.97
 LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20212.00 = 1187.78 FEET.
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                                  ______
 FLOW PROCESS FROM NODE 20212.00 TO NODE 20213.00 IS CODE = 63
                                                                                    UPSTREAM ELEVATION(FEET) = 1843.00 DOWNSTREAM ELEVATION(FEET) = 1840.00
                                                                                    STREET LENGTH (FEET) = 294.25 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 1846.00 DOWNSTREAM ELEVATION(FEET) = 1843.00
                                                                                    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 253.21 CURB HEIGHT (INCHES) = 6.0
                                                                                    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     43.45
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                     STREET FLOW DEPTH (FEET) = 0.61
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 23.69
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.63
   ***STREET FLOWING FULL***
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 16.83
   STREET FLOW DEPTH(FEET) = 0.57
                                                                                    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.737
   HALFSTREET FLOOD WIDTH (FEET) = 21.67
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.09
                                                                                       LAND USE
 STREET FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 15.48
                                                                                   RESIDENTIAL
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.926
                                                                                    "3-4 DWELLINGS/ACRE" A 0.63 0.98 0.600 32
                                                                                    MOBILE HOME PARK A 1.65 0.98 0.250 32
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                 Αp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.347
                                                                                    SUBAREA AREA(ACRES) = 2.28 SUBAREA RUNOFF(CFS) = 4.92
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.35
                                       0.98
                                                0.600 32
                                                                                    EFFECTIVE AREA(ACRES) = 21.18 AREA-AVERAGED Fm(INCH/HR) = 0.50
                               3.23
                                                  0.250 32
 MOBILE HOME PARK
                       A
                                       0.98
                                                                                    AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                    TOTAL AREA (ACRES) = 21.2 PEAK FLOW RATE (CFS) =
                                                                                                                                             42.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.397
 SUBAREA AREA (ACRES) = 5.58 SUBAREA RUNOFF (CFS) = 12.75
                                                                                    SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 18.90 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                                    5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) =
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                    DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    FLOW VELOCITY (FEET/SEC.) = 3.61 DEPTH*VELOCITY (FT*FT/SEC.) = 2.20
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 10

```
LONGEST FLOWPATH FROM NODE 20210.00 TO NODE 20214.00 = 1735.24 FEET.
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
*******************
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20214.00 IS CODE = 1
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 181.96
______
                                                                                   ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                  STREET FLOW DEPTH (FEET) = 0.82
______
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 39.77
 TOTAL NUMBER OF STREAMS = 2
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.71
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.34
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 2.60 Tc (MIN.) = 19.43
 TIME OF CONCENTRATION (MIN.) = 16.83
                                                                                 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.439
 RAINFALL INTENSITY (INCH/HR) = 2.74
 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
 AREA-AVERAGED Fp (INCH/HR) = 0.98
                                                                                                                     Fρ
                                                                                                                                       SCS
 AREA-AVERAGED Ap = 0.51
                                                                                     LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 EFFECTIVE STREAM AREA(ACRES) = 21.18
                                                                                 RESIDENTIAL
 TOTAL STREAM AREA(ACRES) = 21.18
                                                                                 "3-4 DWELLINGS/ACRE" A 18.86
                                                                                                                        0.98 0.600
                                                                                                                                        32
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  42.69
                                                                                 MOBILE HOME PARK
                                                                                                      A
                                                                                                              19.95
                                                                                                                        0.98 0.250 32
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 ** CONFLUENCE DATA **
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.420
  STREAM
          0
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 SUBAREA AREA (ACRES) = 38.81 SUBAREA RUNOFF (CFS) = 70.90
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                 EFFECTIVE AREA(ACRES) = 110.13 AREA-AVERAGED Fm(INCH/HR) = 0.45
    1
          104.22 20.33 2.353 0.97(0.46) 0.47 60.6 20200.00
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.46
          42.69 16.83 2.737 0.98(0.50) 0.51 21.2 20210.00
                                                                                 TOTAL AREA (ACRES) = 120.6 PEAK FLOW RATE (CFS) = 197.21
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 DEPTH(FEET) = 0.84 HALFSTREET FLOOD WIDTH(FEET) = 40.62
  NUMBER
                                                                                 FLOW VELOCITY (FEET/SEC.) = 7.90 DEPTH*VELOCITY (FT*FT/SEC.) = 6.63
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          146.47 16.83 2.737 0.98(0.47) 0.48 71.3 20210.00
          139.59 20.33 2.353 0.97(0.47) 0.48 81.8 20200.00
                                                                                 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 146.47 Tc (MIN.) = 16.83
                                                                                 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 EFFECTIVE AREA(ACRES) = 71.32 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.48
                                                                                 ASSUME FULL-FLOWING PIPELINE
 TOTAL AREA (ACRES) = 81.8
                                                                                 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.09
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20214.00 = 3451.11 FEET.
                                                                                                   41.17
                                                                                 PIPE-FLOW(CFS) =
                                                                                 PIPEFLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 18.36
******************
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.553
                                                                                 SUBAREA AREA (ACRES) = 38.81 SUBAREA RUNOFF (CFS) = 74.85
 FLOW PROCESS FROM NODE 20214.00 TO NODE 20215.00 IS CODE = 63
                                                                                 TOTAL AREA(ACRES) = 120.6
                                                                                                               PEAK FLOW RATE (CFS) = 208.42
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
_____
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1793.00
                                                                                 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET LENGTH (FEET) = 1205.58 CURB HEIGHT (INCHES) = 8.0
                                                                                 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 167.25
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  ***STREET FLOWING FULL***
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  STREET FLOW DEPTH (FEET) = 0.81
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 38.97
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.49
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.04
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 ** PEAK FLOW RATE TABLE **
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                       HEADWATER
```

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 12

Date: 04/21/2014

File name: LR0202ZZ.RES

```
NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                              (ACRES)
                                                          NODE
    1
           208.42 18.36 2.553 0.97(0.45) 0.46 110.1 20210.00
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
    2
          191.98 21.86 2.220 0.98(0.45) 0.46 120.6 20200.00
                                                                                  DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 44.59
 NEW PEAK FLOW DATA ARE:
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.81 DEPTH*VELOCITY (FT*FT/SEC.) = 7.17
 PEAK FLOW RATE (CFS) = 208.42 Tc (MIN.) = 18.36
 AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.97
                                                                                  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 AREA-AVERAGED Ap = 0.46 EFFECTIVE AREA(ACRES) = 110.13
                                                                                        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20215.00 = 4656.69 FEET.
                                                                                  SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
*************
                                                                                  ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
 FLOW PROCESS FROM NODE 20215.00 TO NODE 20216.00 IS CODE = 63
                                                                                  ASSUME FULL-FLOWING PIPELINE
                                                                                  PIPE-FLOW VELOCITY (FEET/SEC.) = 13.49
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  PIPE-FLOW(CFS) =
                                                                                                      66.27
                                                                                  PIPEFLOW TRAVEL TIME (MIN.) = 2.13 Tc (MIN.) = 20.50
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
_____
                                                                                   * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.338
 UPSTREAM ELEVATION (FEET) = 1793.00 DOWNSTREAM ELEVATION (FEET) = 1740.00
                                                                                  SUBAREA AREA (ACRES) = 50.04 SUBAREA RUNOFF (CFS) = 84.08
 STREET LENGTH (FEET) = 1725.28 CURB HEIGHT (INCHES) = 8.0
                                                                                  TOTAL AREA (ACRES) = 170.6 PEAK FLOW RATE (CFS) = 266.89
 STREET HALFWIDTH (FEET) = 32.00
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 200.62
                                                                                    ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREET FLOW DEPTH (FEET) = 0.87
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 42.09
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.33
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.36
                                                                                  ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 247.55
   ***STREET FLOWING FULL***
                                                                                   STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                            272.95 20.36 2.350 0.97(0.46) 0.47 160.2 20210.00
   STREET FLOW DEPTH(FEET) = 0.92
                                                                                   1
   HALFSTREET FLOOD WIDTH (FEET) = 44.59
                                                                                            244.68 24.15 2.050 0.97(0.46) 0.47 170.6 20200.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.80
                                                                                  NEW PEAK FLOW DATA ARE:
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.17
                                                                                  PEAK FLOW RATE (CFS) = 272.95 Tc (MIN.) = 20.36
 STREET FLOW TRAVEL TIME (MIN.) = 3.68 Tc (MIN.) = 22.05
                                                                                  AREA-AVERAGED Fm(INCH/HR) = 0.46 AREA-AVERAGED Fp(INCH/HR) = 0.97
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.205
                                                                                  AREA-AVERAGED Ap = 0.47 EFFECTIVE AREA(ACRES) = 160.17
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20216.00 = 6381.97 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Аp
                                                        SCS
                                                                                 *****************
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  FLOW PROCESS FROM NODE 20216.00 TO NODE 20232.00 IS CODE = 63
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 24.17
                                        0.98
                                                 0.600 32
                      A
                              9.62
                                         0.98
                                                 0.600 32
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 MOBILE HOME PARK
                      A 14.92
                                         0.98
                                                 0.250 32
                                                                                  >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                         0.98
                       A 0.89
                                                 0.100 32
                                                                                 _____
 COMMERCIAL
 RESIDENTIAL
                                                                                  UPSTREAM ELEVATION(FEET) = 1740.00 DOWNSTREAM ELEVATION(FEET) = 1739.00
                     в 0.13
                                                 0.600 56
 "3-4 DWELLINGS/ACRE"
                                         0.75
                                                                                  STREET LENGTH (FEET) = 1052.00 CURB HEIGHT (INCHES) = 8.0
                                                 0.100 56
                                                                                  STREET HALFWIDTH (FEET) = 32.00
 COMMERCIAL
                        В
                                0.31
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.484
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 SUBAREA AREA(ACRES) = 50.04 SUBAREA RUNOFF(CFS) = 78.10
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 EFFECTIVE AREA(ACRES) = 160.17 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 170.6 PEAK FLOW RATE (CFS) = 247.76
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 13

File name: LR0202ZZ.RES

Page 14

Date: 04/21/2014

```
LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
******************
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.00
 RAINFALL INTENSITY (INCH/HR) = 2.06
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.96
 AREA-AVERAGED Ap = 0.49
 EFFECTIVE STREAM AREA(ACRES) = 171.27
 TOTAL STREAM AREA (ACRES) = 181.70
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 272.95
******************
 FLOW PROCESS FROM NODE 20220.00 TO NODE 20221.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 598.74
 ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1925.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 12.057
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.574
 SUBAREA TC AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                   Fр
                                            Ар
                                                    SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.11 0.98 0.600 32 12.06
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 13.75
 TOTAL AREA (ACRES) = 5.11 PEAK FLOW RATE (CFS) = 13.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20221.00 TO NODE 20222.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 1925.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1915.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 551.44
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .1500
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.947
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                    SCS
      Date: 04/21/2014 File name: LR0202ZZ.RES
                                                   Page 16
```

Date: 04/21/2014 Page 15 File name: LR020277.RFS

PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.70

```
LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                              5.86
                                          0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.58
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 0.67
 AVERAGE FLOW DEPTH(FEET) = 0.98 FLOOD WIDTH(FEET) = 77.60
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 13.71 Tc (MIN.) = 25.77
 SUBAREA AREA(ACRES) = 5.86
                                SUBAREA RUNOFF (CFS) = 7.18
 EFFECTIVE AREA(ACRES) = 10.97 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 11.0
                                 PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.92 FLOOD WIDTH(FEET) = 70.29
 FLOW VELOCITY (FEET/SEC.) = 0.64 DEPTH*VELOCITY (FT*FT/SEC) = 0.59
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20222.00 = 1150.18 FEET.
*********************
 FLOW PROCESS FROM NODE 20222.00 TO NODE 20223.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1915.00 DOWNSTREAM ELEVATION(FEET) = 1905.00
 STREET LENGTH (FEET) = 354.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.46
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.02
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
 STREET FLOW TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 27.24
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.862
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Дp
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 11.15
                                       0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
```

File name: LR020277.RFS

Page 17

Date: 04/21/2014

```
EFFECTIVE AREA(ACRES) = 22.12 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 22.1
                                 PEAK FLOW RATE(CFS) =
                                                           25.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.87
 FLOW VELOCITY (FEET/SEC.) = 4.29 DEPTH*VELOCITY (FT*FT/SEC.) = 1.99
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 354.0 FT WITH ELEVATION-DROP = 10.0 FT, IS 40.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20223.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20223.00 = 1504.18 FEET.
******************
 FLOW PROCESS FROM NODE 20223.00 TO NODE 20224.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1905.00 DOWNSTREAM ELEVATION(FEET) = 1895.00
 STREET LENGTH (FEET) = 253.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     29.92
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.34
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 28.07
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.818
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                         SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      A 2.51 0.98 0.250 32
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.90 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.481
 SUBAREA AREA (ACRES) = 7.41 SUBAREA RUNOFF (CFS) = 8.99
 EFFECTIVE AREA(ACRES) = 29.53 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.57
 TOTAL AREA(ACRES) = 29.5 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

File name: LR0202ZZ.RES

Page 18

Date: 04/21/2014

SUBAREA AREA (ACRES) = 11.15 SUBAREA RUNOFF (CFS) = 12.82

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.65
 FLOW VELOCITY (FEET/SEC.) = 5.19 DEPTH*VELOCITY (FT*FT/SEC.) = 2.49
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20224.00 = 1757.18 FEET.
*******************
 FLOW PROCESS FROM NODE 20224.00 TO NODE 20225.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1895.00 DOWNSTREAM ELEVATION(FEET) = 1885.00
 STREET LENGTH (FEET) = 323.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  39.32
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.51
  HALFSTREET FLOOD WIDTH (FEET) = 18.68
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.62
 STREET FLOW TRAVEL TIME (MIN.) = 1.06 Tc (MIN.) = 29.13
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.765
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FO
                                                         SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     A 3.70 0.98
                                                0.250 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.13 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.468
 SUBAREA AREA (ACRES) = 9.83 SUBAREA RUNOFF (CFS) = 11.57
 EFFECTIVE AREA(ACRES) = 39.36 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.54
 TOTAL AREA(ACRES) = 39.4 PEAK FLOW RATE(CFS) = 43.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.42
 FLOW VELOCITY (FEET/SEC.) = 5.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.79
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 323.5 FT WITH ELEVATION-DROP = 10.0 FT, IS 46.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20225.00
```

```
******************
 FLOW PROCESS FROM NODE 20225.00 TO NODE 20226.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1885.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 288.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  49.26
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.84
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.72
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.07
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 29.97
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.725
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                              αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.52 0.98 0.600 32
                              6.40 0.98 0.250 32
 MOBILE HOME PARK
                      A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349
 SUBAREA AREA (ACRES) = 8.92 SUBAREA RUNOFF (CFS) = 11.12
 EFFECTIVE AREA(ACRES) = 48.28 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.51
 TOTAL AREA (ACRES) = 48.3 PEAK FLOW RATE (CFS) = 53.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.39
 FLOW VELOCITY (FEET/SEC.) = 5.90 DEPTH*VELOCITY (FT*FT/SEC.) = 3.23
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 288.5 FT WITH ELEVATION-DROP = 10.0 FT, IS 45.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20226.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20226.00 = 2369.18 FEET.
******************
 FLOW PROCESS FROM NODE 20226.00 TO NODE 20227.00 IS CODE = 63
```

LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20225.00 = 2080.68 FEET.

Date: 04/21/2014 File name: LR0202ZZ.RES Page 19

File name: LR0202ZZ.RES

Date: 04/21/2014

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION (FEET) = 1875.00 DOWNSTREAM ELEVATION (FEET) = 1863.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 404.50 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                 72.14
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                                   STREET FLOW DEPTH (FEET) = 0.58
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 22.16
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.83
                                                   61.12
   ***STREET FLOWING FULL***
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 32.04
   STREET FLOW DEPTH (FEET) = 0.58
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.636
   HALFSTREET FLOOD WIDTH (FEET) = 22.04
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.85
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                                                                                                       SCS
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.40
                                                                                     LAND USE
                                                                                 MOBILE HOME PARK
                                                                                                    A 4.46 0.98 0.250
 STREET FLOW TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 31.12
                                                                                                                                        32
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.674
                                                                                                      A 4.98 0.98 0.850
                                                                                                                                        32
                                                                                 PUBLIC PARK
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" A 1.96 0.98 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap SCS
                                                                                                                                        32
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
     LAND USE
 MOBILE HOME PARK A 9.70
                                      0.98
                                               0.250 32
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.572
                                                                                 SUBAREA AREA (ACRES) = 11.40 SUBAREA RUNOFF (CFS) = 11.06
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.00 0.98 0.600 32
                                                                                 EFFECTIVE AREA(ACRES) = 72.38 AREA-AVERAGED Fm(INCH/HR) = 0.48
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.49
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.333
                                                                                 TOTAL AREA (ACRES) = 72.4 PEAK FLOW RATE (CFS) = 75.56
 SUBAREA AREA (ACRES) = 12.70 SUBAREA RUNOFF (CFS) = 15.42
 EFFECTIVE AREA(ACRES) = 60.98 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.47
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 TOTAL AREA (ACRES) = 61.0 PEAK FLOW RATE (CFS) = 66.61
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.91 DEPTH*VELOCITY (FT*FT/SEC.) = 4.09
                                                                                 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                       AND L = 374.5 FT WITH ELEVATION-DROP = 15.0 FT, IS 52.0 CFS,
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.77
                                                                                       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20228.00
 FLOW VELOCITY(FEET/SEC.) = 6.00 DEPTH*VELOCITY(FT*FT/SEC.) = 3.57
                                                                                 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20228.00 = 3148.18 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                ******************
       AND L = 404.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 56.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20227.00
                                                                                 FLOW PROCESS FROM NODE 20228.00 TO NODE 20229.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20227.00 = 2773.68 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20227.00 TO NODE 20228.00 IS CODE = 63
                                                                                _____
______
                                                                                 UPSTREAM ELEVATION(FEET) = 1848.00 DOWNSTREAM ELEVATION(FEET) = 1826.00
                                                                                 STREET LENGTH (FEET) = 510.53 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 1863.00 DOWNSTREAM ELEVATION(FEET) = 1848.00
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 374.50 CURB HEIGHT (INCHES) = 6.0
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 22

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                82.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 23.02
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.39
 STREET FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 33.20
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.590
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                    A 5.30 0.98
                                                0.250 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 4.30
                                     0.98 0.600 32
               A
 PUBLIC PARK
                              6.33
                                               0.850 32
                                        0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
 SUBAREA AREA(ACRES) = 15.93 SUBAREA RUNOFF(CFS) = 14.64
 EFFECTIVE AREA(ACRES) = 88.31 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 88.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.51
 FLOW VELOCITY (FEET/SEC.) = 7.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.52
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 510.5 FT WITH ELEVATION-DROP = 22.0 FT, IS 65.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20229.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20229.00 = 3658.71 FEET.
********************
 FLOW PROCESS FROM NODE 20229.00 TO NODE 20230.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1826.00 DOWNSTREAM ELEVATION(FEET) = 1800.00
 STREET LENGTH (FEET) = 713.66 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.28
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.66
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 34.85
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.529
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 MOBILE HOME PARK
                     A 11.14 0.98 0.250 32
                      A 6.85 0.98 0.850
 PUBLIC PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.99 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.501
 SUBAREA AREA (ACRES) = 21.98 SUBAREA RUNOFF (CFS) = 20.59
 EFFECTIVE AREA(ACRES) = 110.29 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) = 110.3 PEAK FLOW RATE(CFS) = 103.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.82
 FLOW VELOCITY (FEET/SEC.) = 7.32 DEPTH*VELOCITY (FT*FT/SEC.) = 4.81
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 713.7 FT WITH ELEVATION-DROP = 26.0 FT, IS 79.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20230.00
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20230.00 = 4372.37 FEET.
******************
 FLOW PROCESS FROM NODE 20230.00 TO NODE 20231.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 1800.00 DOWNSTREAM ELEVATION (FEET) = 1769.00
 STREET LENGTH (FEET) = 900.35 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
```

File name: LR0202ZZ.RES

Page 24

Date: 04/21/2014

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 117.92
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   ***STREET FLOWING FULL***
                                                                                   STREET FLOW DEPTH (FEET) = 0.72
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 29.12
   STREET FLOW DEPTH(FEET) = 0.69
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.58
   HALFSTREET FLOOD WIDTH (FEET) = 27.53
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.48
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.42
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.99 Tc (MIN.) = 38.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.12
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.401
 STREET FLOW TRAVEL TIME (MIN.) = 2.02 Tc (MIN.) = 36.87
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.462
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                   A 0.17 0.98 0.250
                                                                                 MOBILE HOME PARK
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                      B 5.75 0.75 0.250
                                                                                 MOBILE HOME PARK
     LAND USE
 MOBILE HOME PARK A 14.01
MOBILE HOME PARK B 8.21
                                        0.98
                                                0.250
                                                                                 RESIDENTIAL
                                                0.250 56
                                                                                 "3-4 DWELLINGS/ACRE" B 11.10 0.75 0.600 56
                                        0.75
 RESIDENTIAL
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" A 2.69
                                        0.98
                                                0.600
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.478
 RESIDENTIAL
                                                                                 SUBAREA AREA (ACRES) = 17.02 SUBAREA RUNOFF (CFS) = 15.98
 "3-4 DWELLINGS/ACRE" B 3.23 0.75 0.600 56
                                                                                 EFFECTIVE AREA(ACRES) = 155.45 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
                                                                                 TOTAL AREA (ACRES) = 155.4 PEAK FLOW RATE (CFS) = 134.62
 SUBAREA AREA (ACRES) = 28.14 SUBAREA RUNOFF (CFS) = 29.84
 EFFECTIVE AREA(ACRES) = 138.43 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.96 AREA-AVERAGED Ap = 0.47
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 TOTAL AREA (ACRES) = 138.4 PEAK FLOW RATE (CFS) = 126.14
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.18
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                 FLOW VELOCITY (FEET/SEC.) = 7.58 DEPTH*VELOCITY (FT*FT/SEC.) = 5.48
                                                                                 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                       AND L = 905.4 FT WITH ELEVATION-DROP = 30.0 FT, IS 57.5 CFS,
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 28.20
                                                                                       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20232.00
 FLOW VELOCITY (FEET/SEC.) = 7.58 DEPTH*VELOCITY (FT*FT/SEC.) = 5.34
                                                                                 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20232.00 = 6178.11 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                               ******************
       AND L = 900.3 FT WITH ELEVATION-DROP = 31.0 FT, IS 97.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20231.00
                                                                                 FLOW PROCESS FROM NODE 20232.00 TO NODE 20232.00 IS CODE = 1
 LONGEST FLOWPATH FROM NODE 20220.00 TO NODE 20231.00 = 5272.72 FEET.
                                                                                 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
********************
                                                                                 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 FLOW PROCESS FROM NODE 20231.00 TO NODE 20232.00 IS CODE = 63
                                                                               _____
______
                                                                                 TOTAL NUMBER OF STREAMS = 2
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 TIME OF CONCENTRATION (MIN.) = 38.86
_____
                                                                                 RAINFALL INTENSITY (INCH/HR) = 1.40
 UPSTREAM ELEVATION(FEET) = 1769.00 DOWNSTREAM ELEVATION(FEET) = 1739.00
                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.44
 STREET LENGTH (FEET) = 905.39 CURB HEIGHT (INCHES) = 6.0
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.94
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 AREA-AVERAGED Ap = 0.47
                                                                                 EFFECTIVE STREAM AREA(ACRES) = 155.45
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 TOTAL STREAM AREA(ACRES) = 155.45
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 PEAK FLOW RATE (CFS) AT CONFLUENCE = 134.62
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ** CONFLUENCE DATA **
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREAM
                                                                                         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR)
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 1 272.95 24.00 2.061 0.96(0.44) 0.46 171.3 20210.00
                                                                                          244.68 27.87 1.828 0.96(0.45) 0.46 181.7 20200.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   1
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
                                                                                   2 134.62 38.86 1.401 0.94(0.44) 0.47 155.4 20220.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 134.13
                                                                                 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
   ***STREET FLOWING FULL***
                                                                                 CONFLUENCE FORMULA USED FOR 2 STREAMS.
```

SCS

32

56

(ACRES) NODE

Date: 04/21/2014 Page 25 Date: 04/21/2014 File name: LR0202ZZ.RES Page 26 File name: LR020277.RFS

```
** PEAK FLOW RATE TABLE **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          407.57 24.00 2.061 0.95(0.44) 0.46 267.3 20210.00
    1
    2
        379.29 27.87 1.828 0.95(0.44) 0.46 293.2 20200.00
          303.74 38.86 1.401 0.95(0.44) 0.47 337.2 20220.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 407.57 Tc (MIN.) = 24.00
 EFFECTIVE AREA(ACRES) = 267.27 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.95 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 337.2
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20232.00 = 7433.97 FEET.
******************
 FLOW PROCESS FROM NODE 20232.00 TO NODE 20249.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1739.00 DOWNSTREAM ELEVATION(FEET) = 1735.00
 STREET LENGTH (FEET) = 1274.82 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 418.36
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.54
   HALFSTREET FLOOD WIDTH (FEET) = 75.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.04
 STREET FLOW TRAVEL TIME (MIN.) = 5.42 Tc (MIN.) = 29.42
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.751
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               Дp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.11 0.98 0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 18.30
                                      0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 21.56
 EFFECTIVE AREA(ACRES) = 285.68 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 355.6 PEAK FLOW RATE (CFS) = 407.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.53 HALFSTREET FLOOD WIDTH(FEET) = 75.11
 FLOW VELOCITY (FEET/SEC.) = 3.89 DEPTH*VELOCITY (FT*FT/SEC.) = 5.95
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 87.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.77
 PIPE-FLOW(CFS) = 362.37
 PIPEFLOW TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 26.42
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.908
 SUBAREA AREA(ACRES) = 18.41 SUBAREA RUNOFF(CFS) = 24.17
 TOTAL AREA (ACRES) = 355.6 PEAK FLOW RATE (CFS) = 407.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 45.20
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 38.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.67
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.
*******************
 FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.42
 RAINFALL INTENSITY (INCH/HR) = 1.91
 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.47
 EFFECTIVE STREAM AREA(ACRES) = 285.68
 TOTAL STREAM AREA(ACRES) = 355.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 407.57
******************
 FLOW PROCESS FROM NODE 20240.00 TO NODE 20241.00 IS CODE = 21
______
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 916.98
 ELEVATION DATA: UPSTREAM(FEET) = 1880.00 DOWNSTREAM(FEET) = 1855.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 28

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.964
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.373
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS Tc
                                       Fρ
                                                 Αp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                               4.79
                                        0.98
                                                0.600
                                                       32 12.96
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.77 0.75 0.600
                                                      56 12.96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) =
                     21.94
                   8.56 PEAK FLOW RATE (CFS) =
 TOTAL AREA (ACRES) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20241.00 TO NODE 20242.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1855.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1848.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 207.39
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.259
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                       SCS
                                                αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.59
                                        0.98
                                                0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В
                             2.06
                                        0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 26.46
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.10
 AVERAGE FLOW DEPTH(FEET) = 0.58 FLOOD WIDTH(FEET) = 29.51
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 13.53
 SUBAREA AREA(ACRES) = 3.65
                                SUBAREA RUNOFF(CFS) = 9.04
 EFFECTIVE AREA(ACRES) = 12.21
                               AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 12.2 PEAK FLOW RATE (CFS) =
                                                         30.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.59 FLOOD WIDTH (FEET) = 31.60
 FLOW VELOCITY (FEET/SEC.) = 6.17 DEPTH*VELOCITY (FT*FT/SEC) = 3.66
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20242.00 = 1124.37 FEET.
```

FLOW PROCESS FROM NODE 20242.00 TO NODE 20243.00 IS CODE = 92 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA< \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1848.00 DOWNSTREAM NODE ELEVATION (FEET) = 1840.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 276.91 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700 MAXIMUM DEPTH(FEET) = 1.00\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.117 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" A 2.48 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 3.59 0.75 0.600 56 RESIDENTIAL ".4 DWELLING/ACRE" B 0.59 0.75 0.900 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.88 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.96 AVERAGE FLOW DEPTH (FEET) = 0.64 FLOOD WIDTH (FEET) = 36.68 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 14.30 SUBAREA AREA(ACRES) = 6.66 SUBAREA RUNOFF (CFS) = 15.57EFFECTIVE AREA(ACRES) = 18.87 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.61 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = 44.11 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43 END OF SUBAREA "V" GUTTER HYDRAULICS: DEPTH (FEET) = 0.66 FLOOD WIDTH (FEET) = 39.37 FLOW VELOCITY (FEET/SEC.) = 6.11 DEPTH\*VELOCITY (FT\*FT/SEC) = 4.03 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20243.00 = 1401.28 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20243.00 TO NODE 20244.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1840.00 DOWNSTREAM ELEVATION(FEET) = 1830.00 STREET LENGTH (FEET) = 293.50 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

File name: LR0202ZZ.RES

Page 30

Date: 04/21/2014

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.15
 STREET FLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 15.84
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.873
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.55
                                         0.98
                                                0.600
                                                        32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.04
                                         0.75
                                                0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 1.15 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.645
 SUBAREA AREA (ACRES) = 7.74 SUBAREA RUNOFF (CFS) = 16.34
 EFFECTIVE AREA(ACRES) = 35.20 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 35.2 PEAK FLOW RATE (CFS) = 74.43
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.34
 FLOW VELOCITY (FEET/SEC.) = 7.19 DEPTH*VELOCITY (FT*FT/SEC.) = 4.35
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20245.00 = 1967.78 FEET.
******************
 FLOW PROCESS FROM NODE 20245.00 TO NODE 20246.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1815.00 DOWNSTREAM ELEVATION(FEET) = 1805.00
 STREET LENGTH (FEET) = 359.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   84.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.69
   HALFSTREET FLOOD WIDTH (FEET) = 27.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 16.87
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.732
 SUBAREA LOSS RATE DATA (AMC II):
```

File name: LR0202ZZ.RES

Page 32

Date: 04/21/2014

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 4.88 0.75 0.600 56 RESIDENTIAL ".4 DWELLING/ACRE" B 0.55 0.75 0.900 56				
"3-4 DWELLINGS/ACRE" A 3.90 0.98 0.600 32 RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620				
"3-4 DWELLINGS/ACRE" B 5.36 0.75 0.600 56 RESIDENTIAL	SUBAREA AREA(ACRES) = 8.45 SUBAREA RUNOFF(CFS) = 16.08				
".4 DWELLING/ACRE" B 0.93 0.75 0.900 56	EFFECTIVE AREA(ACRES) = 53.84 AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.62				
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.627	TOTAL AREA(ACRES) = 53.8 PEAK FLOW RATE(CFS) = 101.97				
SUBAREA AREA(ACRES) = 10.19 SUBAREA RUNOFF(CFS) = 20.27	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):				
EFFECTIVE AREA(ACRES) = 45.39 AREA-AVERAGED Fm(INCH/HR) = 0.52  AREA-AVERAGED Fp(INCH/HR) = 0.84 AREA-AVERAGED Ap = 0.63	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43				
TOTAL AREA(ACRES) = 45.4 PEAK FLOW RATE(CFS) = 90.22	END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.72    HALFSTREET FLOOD WIDTH(FEET) = 28.44				
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	FLOW VELOCITY (FEET/SEC.) = 6.39 DEPTH*VELOCITY (FT*FT/SEC.) = 4.57				
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43	LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20247.00 = 2650.82 FEET.				
END OF SUBAREA STREET FLOW HYDRAULICS:	******************				
DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.77  FLOW VELOCITY(FEET/SEC.) = 5.94 DEPTH*VELOCITY(FT*FT/SEC.) = 4.17	FLOW PROCESS FROM NODE 20247.00 TO NODE 20248.00 IS CODE = 63				
LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20246.00 = 2326.78 FEET.	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA				
***************	>>>> (STREET TABLE SECTION # 18 USED) <<<<				
FLOW PROCESS FROM NODE 20246.00 TO NODE 20247.00 IS CODE = 63	UPSTREAM ELEVATION(FEET) = 1795.00 DOWNSTREAM ELEVATION(FEET) = 1782.00				
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	STREET LENGTH(FEET) = 263.00 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 26.00				
>>>> (STREET TABLE SECTION # 18 USED) <<<<	SIREEI HADEWIDIH (FEEI) - 20.00				
	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00				
UPSTREAM ELEVATION(FEET) = 1805.00 DOWNSTREAM ELEVATION(FEET) = 1795.00 STREET LENGTH(FEET) = 324.04 CURB HEIGHT(INCHES) = 8.0 STREET HALFWIDTH(FEET) = 26.00	INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020				
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020				
INSIDE STREET CROSSFALL(DECIMAL) = 0.020	Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180				
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74				
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	++mpaget mime complimed lighter companies elongoes - 100 06				
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 108.86  ***STREET FLOWING FULL***				
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:				
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83	STREET FLOW DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 26.97				
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 98.25	AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.60				
***STREET FLOWING FULL***	PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.21				
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.71	STREET FLOW TRAVEL TIME(MIN.) = 0.58 Tc(MIN.) = 18.30 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.560				
HALFSTREET FLOOD WIDTH(FEET) = 28.07	SUBAREA LOSS RATE DATA (AMC II):				
AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.32	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS				
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.48	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN				
STREET FLOW TRAVEL TIME(MIN.) = 0.85 Tc(MIN.) = 17.73	RESIDENTIAL				
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.626 SUBAREA LOSS RATE DATA(AMC II):	"3-4 DWELLINGS/ACRE" A 1.94 0.98 0.600 32 RESIDENTIAL				
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	"3-4 DWELLINGS/ACRE" B 5.00 0.75 0.600 56 RESIDENTIAL				
RESIDENTIAL	".4 DWELLING/ACRE" B 0.49 0.75 0.900 56				
"3-4 DWELLINGS/ACRE" A 3.02 0.98 0.600 32 RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.81 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620				
	• •				

Date: 04/21/2014

File name: LR0202ZZ.RES

Page 34

Date: 04/21/2014

File name: LR0202ZZ.RES

```
SUBAREA AREA (ACRES) = 7.43 SUBAREA RUNOFF (CFS) = 13.78
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA (ACRES) = 61.27 AREA-AVERAGED Fm (INCH/HR) = 0.52
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 61.3 PEAK FLOW RATE (CFS) = 112.53
                                                                            END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                            DEPTH (FEET) = 0.76 HALFSTREET FLOOD WIDTH (FEET) = 30.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            FLOW VELOCITY (FEET/SEC.) = 6.81 DEPTH*VELOCITY (FT*FT/SEC.) = 5.19
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                            LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20249.00 = 4503.33 FEET.
                                                                           ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.22
                                                                            FLOW PROCESS FROM NODE 20249.00 TO NODE 20249.00 IS CODE = 1
 FLOW VELOCITY(FEET/SEC.) = 7.71 DEPTH*VELOCITY(FT*FT/SEC.) = 5.33
                                                                           ______
 LONGEST FLOWPATH FROM NODE 20240.00 TO NODE 20248.00 = 2913.82 FEET.
                                                                            >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                            >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
*****************
                                                                           _____
 FLOW PROCESS FROM NODE 20248.00 TO NODE 20249.00 IS CODE = 63
                                                                            TOTAL NUMBER OF STREAMS = 2
______
                                                                            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                            TIME OF CONCENTRATION (MIN.) = 22.17
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                            RAINFALL INTENSITY (INCH/HR) = 2.20
AREA-AVERAGED Fm(INCH/HR) = 0.50
 UPSTREAM ELEVATION (FEET) = 1782.00 DOWNSTREAM ELEVATION (FEET) = 1735.00
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.81
 STREET LENGTH (FEET) = 1589.51 CURB HEIGHT (INCHES) = 8.0
                                                                            AREA-AVERAGED Ap = 0.62
 STREET HALFWIDTH (FEET) = 26.00
                                                                            EFFECTIVE STREAM AREA(ACRES) = 83.49
                                                                            TOTAL STREAM AREA(ACRES) = 83.49
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                            PEAK FLOW RATE (CFS) AT CONFLUENCE = 127.33
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                            ** CONFLUENCE DATA **
                                                                             STREAM
                                                                                    Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                             NUMBER
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                        (ACRES) NODE
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              1
                                                                                     407.57 26.42 1.908 0.94(0.44) 0.47 285.7 20210.00
                                                                                     379.29 30.35 1.708 0.94(0.44)0.47
                                                                                                                          311.6 20200.00
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               1
                                                                               1
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     303.74 41.53 1.329 0.94(0.44) 0.47
                                                                                                                          355.6 20220.00
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                                     127.33 22.17 2.195 0.81(0.50) 0.62
                                                                                                                         83.5 20240.00
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 130.00
                                                                            RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
   ***STREET FLOWING FULL***
                                                                            CONFLUENCE FORMULA USED FOR 2 STREAMS.
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                            ** PEAK FLOW RATE TABLE **
  STREET FLOW DEPTH(FEET) = 0.77
  HALFSTREET FLOOD WIDTH (FEET) = 31.00
                                                                             STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.84
                                                                             NUMBER
                                                                                      (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                             1
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.25
                                                                                     534.90 22.17 2.195 0.90(0.46) 0.51 323.3 20240.00
 STREET FLOW TRAVEL TIME (MIN.) = 3.87 Tc (MIN.) = 22.17
                                                                                     513.33 26.42 1.908 0.90(0.46) 0.51
                                                                                                                          369.2 20210.00
                                                                                     470.00 30.35 1.708 0.91(0.46) 0.50 395.1 20200.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.195
                                                                                     365.96 41.53 1.329 0.91 (0.45) 0.50 439.1 20220.00
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            PEAK FLOW RATE (CFS) = 534.90 Tc (MIN.) = 22.17
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.28
                                      0.98
                                              0.600
                                                                            EFFECTIVE AREA(ACRES) = 323.27 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                            AREA-AVERAGED Fp (INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.51
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   в 21.09
                                      0.75
                                             0.600
                                                   56
                                                                            TOTAL AREA (ACRES) =
                                                                                              439.1
 RESIDENTIAL
                                                                            LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20249.00 = 8708.79 FEET.
 "3-4 DWELLINGS/ACRE"
                    в 0.85
                                      0.75 0.600 56
                                                                           *****************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                            FLOW PROCESS FROM NODE 20249.00 TO NODE 20250.00 IS CODE = 63
 SUBAREA AREA (ACRES) = 22.22 SUBAREA RUNOFF (CFS) = 34.89
                                                                           ______
 EFFECTIVE AREA(ACRES) = 83.49 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.62
                                                                            >>>> (STREET TABLE SECTION # 13 USED) <<<<
 TOTAL AREA (ACRES) = 83.5 PEAK FLOW RATE (CFS) = 127.33
                                                                           ______
                                                                            UPSTREAM ELEVATION(FEET) = 1735.00 DOWNSTREAM ELEVATION(FEET) = 1733.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 35 Date: 04/21/2014

File name: LR0202ZZ.RES Page 36

```
STREET LENGTH (FEET) = 391.69 CURB HEIGHT (INCHES) = 8.0
STREET HALFWIDTH (FEET) = 32.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 535.60
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH(FEET) = 1.54
 HALFSTREET FLOOD WIDTH (FEET) = 75.90
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.00
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.72
STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 23.48
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.097
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                   Дp
                                                          SCS
    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 0.58
                                                   0.600 56
                                          0.75
RESIDENTIAL
".4 DWELLING/ACRE"
                      B 0.42 0.75 0.900 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.726
SUBAREA AREA(ACRES) = 1.00
                                SUBAREA RUNOFF (CFS) = 1.40
EFFECTIVE AREA(ACRES) = 324.27 AREA-AVERAGED Fm(INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.51
TOTAL AREA (ACRES) = 440.1 PEAK FLOW RATE (CFS) =
                                                           534.90
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.54 HALFSTREET FLOOD WIDTH(FEET) = 75.84
FLOW VELOCITY (FEET/SEC.) = 5.00 DEPTH*VELOCITY (FT*FT/SEC.) = 7.72
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 81.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 10.67
PIPE-FLOW(CFS) = 382.06
PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 22.79
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.148
SUBAREA AREA(ACRES) = 1.00 SUBAREA RUNOFF(CFS) = 1.44
TOTAL AREA (ACRES) = 440.1 PEAK FLOW RATE (CFS) = 534.90
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 152.84
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 1.03
  HALFSTREET FLOOD WIDTH (FEET) = 50.27
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.71
 LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 20250.00 = 9100.48 FEET.
**********************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
PEAK FLOWRATE TABLE FILE NAME: 20151.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 869.45 Tc (MIN.) = 42.10
 AREA-AVERAGED Fm (INCH/HR) = 0.61 Ybar = 0.66
 TOTAL AREA (ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 869.45 Tc (MIN.) = 42.10
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.66
 TOTAL AREA (ACRES) = 1725.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20151.00 = 15438.18 FEET.
*******************
 FLOW PROCESS FROM NODE 20151.00 TO NODE 20151.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
FLOW PROCESS FROM NODE 20151.00 TO NODE 20250.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1785.00 DOWNSTREAM(FEET) = 1733.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1656.68 CHANNEL SLOPE = 0.0314
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 37 Date: 04/21/2014 File name: LR0202ZZ.RES

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                    470.00 30.96 1.681 0.90(0.46) 0.50 396.1 20200.00
                              869.45
 FLOW VELOCITY (FEET/SEC.) = 24.92 FLOW DEPTH (FEET) = 2.37
                                                                              4
                                                                                    365.96 42.07 1.315 0.91 (0.45) 0.50 440.1 20220.00
 TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 43.21
                                                                            LONGEST FLOWPATH FROM NODE 20200.00 TO NODE 2050.00 = 9100.48 FEET.
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
                                                                            COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
UNIT-HYDROGRAPH DATA:
 FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 81
                                                                            RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.84;3H= 1.54;6H= 2.32;24H= 4.78
______
                                                                            S-GRAPH: VALLEY(DEV.) = 38.4%; VALLEY(UNDEV.) / DESERT= 61.6%
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                   MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
______
                                                                            Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.58; Ybar = 0.63
 MAINLINE Tc(MIN.) = 43.21
                                                                            USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.287
                                                                            DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            3HR = 0.99; 6HR = 0.99; 24HR = 1.00
                                                                            UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2221.2
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                              Αp
                                                    SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
 RESIDENTIAL
                                                                            EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 "3-4 DWELLINGS/ACRE" B 1.58
                                      0.75
                                             0.600
                                                   56
                                                                            Lca/L=0.3,n=.0493; Lca/L=0.4,n=.0442; Lca/L=0.5,n=.0406; Lca/L=0.6,n=.0379
                                                                            TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 350.15
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В 54.48
                                   0.75
                                             0.900 56
                                                                            PEAK FLOW RATE (CFS) = 1106.09
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.892
                                                                          **********************
 SUBAREA AREA(ACRES) = 56.06
                                                                            FLOW PROCESS FROM NODE 20250.00 TO NODE 20250.00 IS CODE = 12
 UNIT-HYDROGRAPH DATA:
                                                                          ______
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.38;24H= 4.87
                                                                           >>>>CLEAR MEMORY BANK # 1 <<<<<
 S-GRAPH: VALLEY(DEV.) = 23.5%; VALLEY(UNDEV.) / DESERT = 76.5%
                                                                          ______
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                          ******************
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.61; Ybar = 0.66
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            FLOW PROCESS FROM NODE 20250.00 TO NODE 20274.00 IS CODE = 54
 DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1781.1
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20250.00 = 17094.86 FEET.
                                                                          ______
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1733.00 DOWNSTREAM(FEET) = 1670.00
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0493; Lca/L=0.4, n=.0442; Lca/L=0.5, n=.0406; Lca/L=0.6, n=.0379
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 2379.03 CHANNEL SLOPE = 0.0265
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 267.31
                                                                            CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 872.67
                                                                            MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 TOTAL AREA (ACRES) = 1781.1 PEAK FLOW RATE (CFS) =
                                                    872.67
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 1106.09
                                                                            FLOW VELOCITY (FEET/SEC.) = 25.17 FLOW DEPTH (FEET) = 2.81
                                                                            TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 44.78
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                            LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
******************
                                                                          *****************
 FLOW PROCESS FROM NODE 20250.00 TO NODE 2050.00 IS CODE = 11
                                                                            FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 81
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          _____
______
                                                                            MAINLINE Tc(MIN.) = 44.78
 ** MAIN STREAM CONFLUENCE DATA **
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.251
 PEAK FLOW RATE (CFS) = 872.67 Tc (MIN.) = 43.21
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fm(INCH/HR) = 0.61 Ybar = 0.66
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                               SCS
                                                                                                                Fρ
                                                                                                                        Aρ
 TOTAL AREA (ACRES) = 1781.1
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 2050.00 = 17094.86 FEET.
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B 3.23
                                                                                                                 0.75
                                                                                                                        0.600
                                                                                                                               56
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                            RESIDENTIAL
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                A
                                                                                                        0.07
                                                                                                                 0.98
                                                                                                                        0.600
                                                                                                                               32
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            RESIDENTIAL
    1
          534.90 22.79 2.148 0.90(0.46) 0.51 324.3 20240.00
                                                                            ".4 DWELLING/ACRE"
                                                                                                 В
                                                                                                        9.49
                                                                                                                 0.75
                                                                                                                        0.900
                                                                                                                               56
          513.33 27.03 1.874 0.90(0.46) 0.51
                                             370.2 20210.00
                                                                            SCHOOL
                                                                                                        24.91
                                                                                                                 0.75
                                                                                                                        0.600
                                                                                                                               56
      Date: 04/21/2014 File name: LR0202ZZ.RES
                                                                                 Date: 04/21/2014
                                                                                                File name: LR0202ZZ.RES
                                                                                                                             Page 40
```

```
SCHOOL
                              0.90 0.98 0.600 32
                        Α
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA(ACRES) = 38.60
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.84;3H= 1.54;6H= 2.31;24H= 4.77
 S-GRAPH: VALLEY(DEV.) = 39.0%; VALLEY(UNDEV.) / DESERT = 61.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.58; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.98; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2259.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0455; Lca/L=0.4,n=.0408; Lca/L=0.5,n=.0375; Lca/L=0.6,n=.0350
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 356.42
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1094.64
 TOTAL AREA (ACRES) = 2259.8
                              PEAK FLOW RATE (CFS) = 1106.09
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*****************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1106.09 Tc (MIN.) = 44.78
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.63
 TOTAL AREA (ACRES) = 2259.8
******************
 FLOW PROCESS FROM NODE 20260.00 TO NODE 20261.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 680.83
 ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2360.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.333
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 5.320
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Αр
                                                       SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                               4.43
                                        0.61
                                                1.000
                                                       66 11.82
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        В
                              2.14
                                        0.75
                                              0.700
                                                      56 7.33
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
 SUBAREA RUNOFF(CFS) =
                     28.00
 TOTAL AREA (ACRES) =
                      6.57 PEAK FLOW RATE(CFS) =
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*************************
 FLOW PROCESS FROM NODE 20261.00 TO NODE 20262.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2360.00 DOWNSTREAM(FEET) = 2280.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 583.76 CHANNEL SLOPE = 0.1370
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              28.00
 FLOW VELOCITY (FEET/SEC.) = 3.95 FLOW DEPTH (FEET) = 0.38
 TRAVEL TIME (MIN.) = 2.47 Tc (MIN.) = 9.80
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20262.00 = 1264.59 FEET.
******************
 FLOW PROCESS FROM NODE 20262.00 TO NODE 20262.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 9.80
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.219
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 4.44 0.75 0.700
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В 15.90
                                   0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.935
 SUBAREA AREA (ACRES) = 20.34 SUBAREA RUNOFF (CFS) = 66.36
 EFFECTIVE AREA(ACRES) = 26.91 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.93
 TOTAL AREA(ACRES) = 26.9
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20262.00 TO NODE 20263.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2170.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 994.37 CHANNEL SLOPE = 0.1106
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            87.86
 FLOW VELOCITY (FEET/SEC.) = 4.91 FLOW DEPTH (FEET) = 0.60
 TRAVEL TIME (MIN.) = 3.37 Tc (MIN.) = 13.17
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20263.00 = 2258.96 FEET.
```

File name: LR020277.RFS

Page 42

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 20263.00 TO NODE 20263.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 13.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 8.82 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 8.82
                           SUBAREA RUNOFF (CFS) = 22.28
 EFFECTIVE AREA(ACRES) = 35.73 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 35.7 PEAK FLOW RATE (CFS) =
                                                 88.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
********************
 FLOW PROCESS FROM NODE 20263.00 TO NODE 20264.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2170.00 DOWNSTREAM(FEET) = 2110.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 784.49 CHANNEL SLOPE = 0.0765
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            88.60
 FLOW VELOCITY (FEET/SEC.) = 4.28 FLOW DEPTH (FEET) = 0.64
 TRAVEL TIME (MIN.) = 3.06 Tc (MIN.) = 16.23
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20264.00 = 3043.45 FEET.
FLOW PROCESS FROM NODE 20264.00 TO NODE 20264.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 16.23
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.818
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 17.48
                                 0.75
                                        0.700
                                               56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                          7.48
                                        1.000
                                   0.61
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.790
 SUBAREA AREA(ACRES) = 24.96
                           SUBAREA RUNOFF (CFS) = 50.93
 EFFECTIVE AREA(ACRES) = 60.69 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) =
                60.7 PEAK FLOW RATE (CFS) = 123.07
```

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20264.00 TO NODE 20265.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2080.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.96 CHANNEL SLOPE = 0.0454
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 123.07
 FLOW VELOCITY (FEET/SEC.) = 3.81 FLOW DEPTH (FEET) = 0.80
 TRAVEL TIME (MIN.) = 2.89 Tc (MIN.) = 19.12
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20265.00 = 3704.41 FEET.
******************
 FLOW PROCESS FROM NODE 20265.00 TO NODE 20265.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 19.12
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.472
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                                           Αp
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 6.85
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                          0.71
                                    0.75
                                           0.900
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            59.45
                                    0.61 1.000
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.968
 SUBAREA AREA(ACRES) = 67.01
                           SUBAREA RUNOFF (CFS) = 112.54
 EFFECTIVE AREA(ACRES) = 127.70 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.91
                 127.7
 TOTAL AREA (ACRES) =
                             PEAK FLOW RATE(CFS) =
                                                 216.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20265.00 TO NODE 20266.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2010.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 947.22 CHANNEL SLOPE = 0.0739
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            216.68
 FLOW VELOCITY (FEET/SEC.) = 5.29 FLOW DEPTH (FEET) = 0.91
 TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 22.10
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20266.00 = 4651.63 FEET.
```

Date: 04/21/2014 File name: LR0202ZZ.RES

Page 44

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
*************************
 FLOW PROCESS FROM NODE 20266.00 TO NODE 20266.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 22.10
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.201
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Ар
                                                    SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                          10.89
                                      0.75
                                             0.700
                                                     56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                          11.99
                                      0.75
                                             0.900
                                                     56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                              4.30
                                      0.61
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.836
 SUBAREA AREA(ACRES) = 27.18
                             SUBAREA RUNOFF (CFS) = 39.06
 EFFECTIVE AREA(ACRES) = 154.88 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) = 154.9
                              PEAK FLOW RATE(CFS) =
                                                    224.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20266.00 TO NODE 20267.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2010.00 DOWNSTREAM(FEET) = 1960.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 906.98 CHANNEL SLOPE = 0.0551
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 224.63
 FLOW VELOCITY (FEET/SEC.) = 4.76 FLOW DEPTH (FEET) = 0.97
 TRAVEL TIME (MIN.) = 3.18 Tc (MIN.) = 25.28
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20267.00 = 5558.61 FEET.
********************
 FLOW PROCESS FROM NODE 20267.00 TO NODE 20267.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 25.28
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.977
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fр
                                              Αр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В
                             53.81
                                      0.75
                                             0.700
                                                   56
 RESIDENTIAL
                                             0.900
 ".4 DWELLING/ACRE"
                             46.51
                                      0.75
                                                     56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             68.77
                                      0.61
                                             1.000
                                                   66
      Date: 04/21/2014
                                                   Page 45
                     File name: LR020277.RFS
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.877
 SUBAREA AREA(ACRES) = 169.09
                           SUBAREA RUNOFF (CFS) = 209.26
 EFFECTIVE AREA(ACRES) = 323.97 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) =
                 324.0
                             PEAK FLOW RATE (CFS) =
                                                  402.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20267.00 TO NODE 20268.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1268.00 CHANNEL SLOPE = 0.0552
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             402.63
 FLOW VELOCITY (FEET/SEC.) = 11.19 FLOW DEPTH (FEET) = 2.42
 TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 27.17
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20268.00 = 6826.61 FEET.
*******************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20268.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 27.17
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.866
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                  SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В
                           30.11
                                    0.75
                                           0.900
                                                  56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В
                          0.46
                                    0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA AREA(ACRES) = 30.57
                            SUBAREA RUNOFF (CFS) = 32.88
 EFFECTIVE AREA(ACRES) = 354.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.89
 TOTAL AREA (ACRES) = 354.5
                             PEAK FLOW RATE(CFS) =
                                                  403.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20268.00 TO NODE 20269.00 IS CODE = 54
._____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1870.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 379.58 CHANNEL SLOPE = 0.0527
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
```

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
                                                                                 LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                             RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 10.99 FLOW DEPTH (FEET) = 2.46
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                   В
                                                                                                        5.45
                                                                                                                  0.75
                                                                                                                          0.600
 TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 27.75
                                                                             RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20269.00 = 7206.19 FEET.
                                                                             ".4 DWELLING/ACRE"
                                                                                                         71.00
                                                                                                                  0.75
                                                                                                                          0.900
                                                                             NATURAL FAIR COVER
*******************
                                                                                                        5.28
                                                                             "OPEN BRUSH"
                                                                                                                  0.61
                                                                                                                          1.000
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20269.00 IS CODE = 81
                                                                             RESIDENTIAL
______
                                                                                                         40.34
                                                                             "2 DWELLINGS/ACRE"
                                                                                                   B
                                                                                                                  0.75
                                                                                                                          0.700
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
______
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.825
                                                                                                         SUBAREA RUNOFF(CFS) = 115.13
 MAINLINE Tc (MIN.) = 27.75
                                                                             SUBAREA AREA(ACRES) = 122.07
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.835
                                                                             EFFECTIVE AREA(ACRES) = 528.99 AREA-AVERAGED Fm(INCH/HR) = 0.60
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.87
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                      Fρ
                                              Aр
                                                                             TOTAL AREA (ACRES) =
                                                                                              529.0
                                                                                                           PEAK FLOW RATE(CFS) =
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 ".4 DWELLING/ACRE"
                     В
                             17.99
                                      0.75
                                              0.900
                                                     56
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 RESIDENTIAL
                                                                           ******************
 "3-4 DWELLINGS/ACRE"
                              0.04
                                       0.75
                                              0.600
                                                     56
                                                                             FLOW PROCESS FROM NODE 20270.00 TO NODE 20271.00 IS CODE = 63
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              18.04
                                       0.61
                                              1.000
                                                                           ______
 RESIDENTIAL
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 "2 DWELLINGS/ACRE"
                       В
                             16.31
                                      0.75
                                            0.700
                                                                             >>>> (STREET TABLE SECTION # 13 USED) <<<<
                                                                           ______
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                             UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1755.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.872
 SUBAREA AREA(ACRES) = 52.38
                              SUBAREA RUNOFF (CFS) = 57.93
                                                                             STREET LENGTH (FEET) = 692.85 CURB HEIGHT (INCHES) = 8.0
 EFFECTIVE AREA(ACRES) = 406.92 AREA-AVERAGED Fm(INCH/HR) = 0.60
                                                                             STREET HALFWIDTH (FEET) = 32.00
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 406.9 PEAK FLOW RATE(CFS) =
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                             SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
*******************
                                                                             STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20269.00 TO NODE 20270.00 IS CODE = 54
                                                                             Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
                                                                               **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1770.00
                                                                               ***STREET FLOWING FULL***
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2346.89 CHANNEL SLOPE = 0.0426
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
                                                                              STREET FLOW DEPTH (FEET) = 1.24
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 5.00
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 60.64
 CHANNEL FLOW THRU SUBAREA(CFS) = 451.25
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.70
 FLOW VELOCITY (FEET/SEC.) = 10.51 FLOW DEPTH (FEET) = 2.76
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.79
 TRAVEL TIME (MIN.) = 3.72 Tc (MIN.) = 31.47
                                                                             STREET FLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 32.79
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20270.00 = 9553.08 FEET.
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.605
                                                                             SUBAREA LOSS RATE DATA (AMC II):
******************
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fρ
                                                                                                                           αA
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20270.00 IS CODE = 81
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
.....
                                                                             RESIDENTIAL
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             ".4 DWELLING/ACRE"
                                                                                                   В
                                                                                                        100.00
                                                                                                                  0.75
                                                                                                                          0.900
______
                                                                             RESIDENTIAL
 MAINLINE Tc(MIN.) = 31.47
                                                                             ".4 DWELLING/ACRE"
                                                                                                   В
                                                                                                         27.18
                                                                                                                  0.75
                                                                                                                          0.900
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.659
                                                                             RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                   B
                                                                                                         11.00
                                                                                                                  0.75
                                                                                                                          0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                                                             RESIDENTIAL
```

Page 47

Date: 04/21/2014

File name: LR0202ZZ.RES

Date: 04/21/2014 File name: LR0202ZZ.RES

56

56

66

56

502.01

570.10

SCS

56

56

56

```
"2 DWELLINGS/ACRE"
                       B 18.36 0.75 0.700 56
                                                                                     3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                                     UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 NATURAL FAIR COVER
                               0.17 0.61 1.000 66
 "OPEN BRUSH"
                         В
                                                                                     LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                     EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.856
                                                                                     Lca/L=0.3,n=.0538; Lca/L=0.4,n=.0482; Lca/L=0.5,n=.0443; Lca/L=0.6,n=.0414
                                SUBAREA RUNOFF(CFS) = 136.14
 SUBAREA AREA(ACRES) = 156.71
                                                                                     TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) =
 EFFECTIVE AREA(ACRES) = 685.70 AREA-AVERAGED Fm(INCH/HR) = 0.61
                                                                                     UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 408.28
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.87
                                                                                     TOTAL PEAK FLOW RATE (CFS) = 408.28 (SOURCE FLOW INCLUDED)
 TOTAL AREA (ACRES) = 685.7 PEAK FLOW RATE (CFS) = 612.48
                                                                                     RATIONAL METHOD PEAK FLOW RATE (CFS) = 632.60
                                                                                     (UPSTREAM NODE PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     PEAK FLOW RATE (CFS) USED = 632.60
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                   ****************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                     FLOW PROCESS FROM NODE 20271.00 TO NODE 20272.00 IS CODE = 63
 DEPTH(FEET) = 1.27 HALFSTREET FLOOD WIDTH(FEET) = 62.11
 FLOW VELOCITY (FEET/SEC.) = 8.86 DEPTH*VELOCITY (FT*FT/SEC.) = 11.25
                                                                                     >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                    >>>> (STREET TABLE SECTION # 13 USED) <<<<
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                   ______
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                     UPSTREAM ELEVATION(FEET) = 1755.00 DOWNSTREAM ELEVATION(FEET) = 1730.00
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                                     STREET LENGTH (FEET) = 1359.40 CURB HEIGHT (INCHES) = 8.0
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
                                                                                     STREET HALFWIDTH (FEET) = 32.00
 ESTIMATED PIPE DIAMETER (INCH) = 69.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 69.0 INCH PIPE IS 55.3 INCHES
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.51
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 PIPE-FLOW(CFS) = 502.01
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 PIPEFLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 31.98
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.638
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA (ACRES) = 156.71 SUBAREA RUNOFF (CFS) = 140.74
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 685.7 PEAK FLOW RATE (CFS) = 632.60
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 130.59
                                                                                      ***STREET FLOWING FULL***
   ***STREET FLOWING FULL***
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                      STREET FLOW DEPTH(FEET) = 1.34
   STREET FLOW DEPTH(FEET) = 0.81
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 65.77
   HALFSTREET FLOOD WIDTH (FEET) = 39.40
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.55
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.68
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 11.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.62
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 2.65 Tc (MIN.) = 34.63
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                     * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.537
       AND L = 692.8 FT WITH ELEVATION-DROP = 15.0 FT, IS 411.2 CFS,
                                                                                     SUBAREA LOSS RATE DATA (AMC II):
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 20271.00
                                                                                     DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                             Fρ
                                                                                                                                             SCS
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20271.00 = 10245.93 FEET.
                                                                                         LAND USE
                                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     RESIDENTIAL
*******************
                                                                                                          В 92.29
                                                                                     ".4 DWELLING/ACRE"
                                                                                                                              0.75
                                                                                                                                      0.900
                                                                                                                                              56
 FLOW PROCESS FROM NODE 20270.00 TO NODE 20271.00 IS CODE = 71
                                                                                     RESIDENTIAL
                                                                                                                   5.58
______
                                                                                     "3-4 DWELLINGS/ACRE"
                                                                                                          В
                                                                                                                              0.75
                                                                                                                                      0.600
                                                                                                                                              56
                                                                                     SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
                                                                                     SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.883
______
                                                                                     UNIT-HYDROGRAPH DATA:
                                                                                     RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
                                                                                     S-GRAPH: VALLEY(DEV.) = 25.8%; VALLEY(UNDEV.) / DESERT= 74.2%
 S-GRAPH: VALLEY(DEV.) = 28.6%; VALLEY(UNDEV.) / DESERT= 71.4%
                                                                                             MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                     Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.62; Ybar = 0.70
 Tc(HR) = 0.53; LAG(HR) = 0.43; Fm(INCH/HR) = 0.61; Ybar = 0.69
                                                                                     USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                     DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                     3HR = 0.99; 6HR = 1.00; 24HR = 1.00
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 49

File name: LR0202ZZ.RES

Page 50

Date: 04/21/2014

```
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 783.6
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20272.00 = 10245.93 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0586; Lca/L=0.4,n=.0525; Lca/L=0.5,n=.0483; Lca/L=0.6,n=.0450
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 98.41
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 433.33
 TOTAL AREA (ACRES) = 783.6
                                   PEAK FLOW RATE (CFS) = 632.60
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.32 HALFSTREET FLOOD WIDTH(FEET) = 64.49
 FLOW VELOCITY (FEET/SEC.) = 8.42 DEPTH*VELOCITY (FT*FT/SEC.) = 11.08
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.98
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER(INCH) = 66.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.66
 PIPE-FLOW(CFS) = 419.93
 PIPEFLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 33.26
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 S-GRAPH: VALLEY (DEV.) = 25.8%; VALLEY (UNDEV.) / DESERT= 74.2%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.53; LAG(HR) = 0.43; Fm(INCH/HR) = 0.62; Ybar = 0.70
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 783.6
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20272.00 = 11605.33 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0481; Lca/L=0.4,n=.0431; Lca/L=0.5,n=.0396; Lca/L=0.6,n=.0369
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 98.41
 TOTAL AREA(ACRES) = 783.6
                                   PEAK FLOW RATE (CFS) = 632.60
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 212.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 45.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.90
*****************
 FLOW PROCESS FROM NODE 20272.00 TO NODE 20273.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
```

```
STREET LENGTH (FEET) = 1247.53 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.27
 HALFSTREET FLOOD WIDTH (FEET) = 56.34
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.18
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.90
STREET FLOW TRAVEL TIME (MIN.) = 2.04 Tc (MIN.) = 35.31
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.513
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                            SCS
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 2.91 0.75
                                                             56
                                                    0.600
RESIDENTIAL
".4 DWELLING/ACRE" B 52.68 0.75 0.900
                                                             56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.884
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.62; Ybar = 0.70
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20273.00 = 11605.33 FEET.
EOUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3, n=.0535; Lca/L=0.4, n=.0479; Lca/L=0.5, n=.0440; Lca/L=0.6, n=.0411
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 104.49
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                        455.95
TOTAL AREA(ACRES) = 839.2
                                    PEAK FLOW RATE(CFS) =
                                                             632.60
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 1.25 HALFSTREET FLOOD WIDTH (FEET) = 55.61
FLOW VELOCITY (FEET/SEC.) = 10.11 DEPTH*VELOCITY (FT*FT/SEC.) = 12.66
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
```

UPSTREAM ELEVATION(FEET) = 1730.00 DOWNSTREAM ELEVATION(FEET) = 1695.00

Date: 04/21/2014 File name: LR0202ZZ.RES Page 51

File name: LR0202ZZ.RES

Date: 04/21/2014

```
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.15
 PIPE-FLOW(CFS) = 458.15
 PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 34.25
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 S-GRAPH: VALLEY (DEV.) = 24.4%; VALLEY (UNDEV.) / DESERT= 75.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.62; Ybar = 0.70
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 839.2
 LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20273.00 = 12852.86 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0457; Lca/L=0.4,n=.0410; Lca/L=0.5,n=.0377; Lca/L=0.6,n=.0351
 TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 104.49
 TOTAL AREA (ACRES) = 839.2
                                    PEAK FLOW RATE (CFS) = 632.60
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 174.46
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 33.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.12
*******************
 FLOW PROCESS FROM NODE 20273.00 TO NODE 20274.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1695.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 797.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 633.83
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.23
```

```
HALFSTREET FLOOD WIDTH (FEET) = 54.39
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.58
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 12.99
STREET FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 35.50
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.506
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                           Fρ
                                                      Aρ
                                                             SCS
    LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
".4 DWELLING/ACRE"
                                  2.08
                                            0.75 0.900
                       В
                                  0.94 0.75
                                                              56
SCHOOL
                          В
                                                     0.600
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
S-GRAPH: VALLEY (DEV.) = 24.4%; VALLEY (UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.62; Ybar = 0.70
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 12852.86 FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3, n=.0491; Lca/L=0.4, n=.0440; Lca/L=0.5, n=.0404; Lca/L=0.6, n=.0377
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 104.89
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
                                         456.09
TOTAL AREA(ACRES) = 842.2
                                    PEAK FLOW RATE (CFS) =
                                                              632.60
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH (FEET) = 1.23 HALFSTREET FLOOD WIDTH (FEET) = 54.39
FLOW VELOCITY (FEET/SEC.) = 10.56 DEPTH*VELOCITY (FT*FT/SEC.) = 12.97
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 22.35
PIPE-FLOW(CFS) = 484.27
PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 34.84
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
S-GRAPH: VALLEY(DEV.) = 24.4%; VALLEY(UNDEV.) / DESERT= 75.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.62; Ybar = 0.70
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
3HR = 0.99; 6HR = 1.00; 24HR = 1.00
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 842.2
LONGEST FLOWPATH FROM NODE 20260.00 TO NODE 20274.00 = 13650.41 FEET.
EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0447; Lca/L=0.4,n=.0401; Lca/L=0.5,n=.0368; Lca/L=0.6,n=.0343
```

Date: 04/21/2014 File name: LR0202ZZ.RES Page 53 Date: 04/21/2014 File name: LR0202ZZ.RES Page 54

```
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 104.89
                   842.2
                                PEAK FLOW RATE (CFS) = 632.60
 TOTAL AREA (ACRES) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 148.33
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.60
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 5.72
*************************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 PEAK FLOW RATE (CFS) = 632.60 Tc (MIN.) = 34.84
 AREA-AVERAGED Fm (INCH/HR) = 0.62 Ybar = 0.70
 TOTAL AREA (ACRES) =
                   842.2
 ** CONFLUENCE DATA **
 STREAM O TC AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES) NODE
   1
         1106.09 44.78 2259.75 20120.00
    2 632.60 34.84 842.18 20260.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.83;3H= 1.51;6H= 2.24;24H= 4.68
 S-GRAPH: VALLEY(DEV.) = 35.1%; VALLEY(UNDEV.)/DESERT= 64.9%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.59; Ybar = 0.65
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.86; 30M = 0.86; 1HR = 0.86;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0455; Lca/L=0.4, n=.0408; Lca/L=0.5, n=.0375; Lca/L=0.6, n=.0350
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 455.40
 PEAK FLOW RATE (CFS) = 1378.41
FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 3101.9 TC (MIN.) =
```

AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.65

File name: LR0202ZZ.RES

Date: 04/21/2014

PEAK FLOW RATE (CFS) = 1378.41

\_\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20376

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0203ZZ.DAT

TIME/DATE OF STUDY: 09:44 04/02/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 22.0 0.020/0.020/0.020 2.00 0.0313 0.167 0.0180 15.0 0.67 15.0 10.0 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 15.0 10.0 0.67 0.020/0.020/0.020 1.50 0.0312 0.125 0.0180 16.0 10.0 0.50 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 0.67 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

17 20.0 10 18 26.0 11	0.020/0 5.0 0.020/0	0.020/0.020	0.50 1. 0.67 2.	.50 0.0312 0.1	125 0.0180 167 0.0180
18     26.0     1       19     52.0     2	0.020/0	0.020/0.020	0.67 2.	.00 0.0312 0.3	167 0.0180
as (Maxim	Flow-Depth = 11mm Allowable Strain Telecity) Constant A FLOW CAPACHE UPSTREAM TE	0.20 FEET Street Flow D straint = 6. CITY GREATER RIBUTARY PIPE	O (FT*FT/S) THAN ·*		ED
USED "VALLEY 1 UNITS/ACRE FOR DEVELOPM PRECIPITATION	G = 0.80 * TC UNDEVELOPED" AND LESS; ANI ENTS OF 2 UNIT N DATA ENTEREI DEPTH-AREA FA	S-GRAPH FOR D "VALLEY DEV. PS/ACRE AND M D ON SUBAREA ACTORS USED.	DEVELOPMENT ELOPED" S-C DRE. BASIS.	GRAPH	APH METHOD
**************************************					
>>>>RATIONAL   >>USE TIME-OF-					
SUBAREA TO AND DEVELOPMENT T LAND USE	IS USED MINIMUNFALL INTENSITALS RATE DATA  LOSS RATE DATA  YPE/ SCS  GRO	JM Tc(MIN.) = TY(INCH/HR) = TA(AMC II): SOIL AREA	8.287 2.624 Fp	Ap S	SCS Tc CN (MIN.
NATURAL FAIR CO		3 6.22	0.61	1.000	66 12.0
RESIDENTIAL ".4 DWELLING/AG SUBAREA AVERAGI SUBAREA AVERAGI SUBAREA RUNOFF TOTAL AREA(ACRI	E PERVIOUS LOS E PERVIOUS ARE (CFS) = 12	SS RATE, Fp(I EA FRACTION, 2.99	NCH/HR) = Ap = 0.986	0.63	56 8.2
SUBAREA AREA-A' 5M = 0.30; 30M				= 2.06; 24HR	= 4.43
**************************************	ROM NODE 2030	01.00 TO NODE	20302.00	IS CODE = 54	1
>>>>COMPUTE T	RAPEZOIDAL CHA E THRU SUBAREA	ANNEL FLOW<<< A (EXISTING E	<< LEMENT) <<<<	<<	
ELEVATION DATA CHANNEL LENGTH CHANNEL BASE(F	: UPSTREAM(FEI THRU SUBAREA	ET) = 2400. (FEET) = 42	00 DOWNSTE 2.45 CHAN	REAM(FEET) = NNEL SLOPE =	2380.00
Data: 04/	01/2014	ila noma. I DO202	77 DEC		200 2

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.24 FLOW DEPTH (FEET) = 0.34
 TRAVEL TIME (MIN.) = 3.14 Tc (MIN.) = 11.43
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20302.00 = 1080.82 FEET.
*******************
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20302.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 11.43
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.164
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   В
                          0.12
                                   0.75
                                          0.900
                                                56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                           4.14
                                   0.61
                                         1.000
                                                66
 SCHOOL
                     В
                            3.66
                                   0.75
                                         0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
 SUBAREA AREA(ACRES) = 7.92
                           SUBAREA RUNOFF (CFS) = 11.58
 EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.65 AREA-AVERAGED Ap = 0.90
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                 21.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*****************
 FLOW PROCESS FROM NODE 20302.00 TO NODE 20303.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2380.00 DOWNSTREAM(FEET) = 2320.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 870.68 CHANNEL SLOPE = 0.0689
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            21.59
 FLOW VELOCITY (FEET/SEC.) = 2.89 FLOW DEPTH (FEET) = 0.39
 TRAVEL TIME (MIN.) = 5.01 Tc (MIN.) = 16.44
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20303.00 = 1951.50 FEET.
******************
 FLOW PROCESS FROM NODE 20303.00 TO NODE 20303.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.44
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.739
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           αA
                                                SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                            4.15
                                   0.61
                                          1.000 66
```

```
RESIDENTIAL
 ".4 DWELLING/ACRE"
                     В
                          0.80
                                   0.75 0.900
                           20.38 0.75 0.600
 SCHOOL
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA(ACRES) = 25.33
                          SUBAREA RUNOFF (CFS) = 28.64
 EFFECTIVE AREA(ACRES) = 40.46 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.76
 TOTAL AREA(ACRES) = 40.5
                            PEAK FLOW RATE(CFS) =
                                                 44.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20303.00 TO NODE 20304.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2320.00 DOWNSTREAM(FEET) = 2280.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 981.07 CHANNEL SLOPE = 0.0408
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            44.45
 FLOW VELOCITY (FEET/SEC.) = 2.84 FLOW DEPTH (FEET) = 0.56
 TRAVEL TIME (MIN.) = 5.76 Tc (MIN.) = 22.21
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20304.00 = 2932.57 FEET.
******************
 FLOW PROCESS FROM NODE 20304.00 TO NODE 20304.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 22.21
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.452
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
 "OPEN BRUSH"
                   B 18.37 0.61 1.000
                                                 66
                          15.66 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.816
 SUBAREA AREA(ACRES) = 34.03
                          SUBAREA RUNOFF(CFS) = 28.01
 EFFECTIVE AREA(ACRES) = 74.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 74.5
                            PEAK FLOW RATE(CFS) =
                                                 62.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
FLOW PROCESS FROM NODE 20304.00 TO NODE 20305.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2280.00 DOWNSTREAM(FEET) = 2220.00
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 4

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 823.37 CHANNEL SLOPE = 0.0729
                                                                           RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                           "2 DWELLINGS/ACRE"
                                                                                                    1.66
                                                                                                                0.75
                                                                                                                       0.700
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           NATURAL FAIR COVER
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                           "OPEN BRUSH"
                                                                                                B 13.33 0.61 1.000
                                                                                                                              66
 FLOW VELOCITY (FEET/SEC.) = 3.85 FLOW DEPTH (FEET) = 0.57
                                                                                                      2.17
                                                                                                               0.75 0.600
                                                                           SCHOOL
                                                                                                В
 TRAVEL TIME (MIN.) = 3.56 Tc (MIN.) = 25.77
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.63
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20305.00 = 3755.94 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.920
                                                                           SUBAREA AREA(ACRES) = 17.16
                                                                                                       SUBAREA RUNOFF (CFS) = 9.65
EFFECTIVE AREA(ACRES) = 109.51 AREA-AVERAGED Fm(INCH/HR) = 0.54
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20305.00 IS CODE = 81
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                           TOTAL AREA (ACRES) = 109.5 PEAK FLOW RATE (CFS) =
                                                                                                                              66.35
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 25.77
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.328
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          ******************
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                   SCS
                                             Αp
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           FLOW PROCESS FROM NODE 20306.00 TO NODE 20307.00 IS CODE = 54
     LAND USE
 NATURAL FAIR COVER
 "OPEN BRUSH"
                    В
                             9.94
                                      0.61
                                             1.000
                                                                           >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                  66
                                                                           >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.01
                                     0.75
                                             0.700
                                                  56
                                                                         _____
 SCHOOL
                      В
                             7.91
                                     0.75
                                             0.600 56
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2185.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 181.13 CHANNEL SLOPE = 0.0276
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.823
                                                                           CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                           MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AREA (ACRES) = 17.86 SUBAREA RUNOFF (CFS) = 12.66
 EFFECTIVE AREA(ACRES) = 92.35 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                           CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                        66.35
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
                                                                           FLOW VELOCITY (FEET/SEC.) = 2.72 FLOW DEPTH (FEET) = 0.70
                                                                           TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 31.26
 TOTAL AREA (ACRES) = 92.3 PEAK FLOW RATE (CFS) =
                                                    66.35
                                                                           LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20307.00 = 4739.04 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          ************************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                           FLOW PROCESS FROM NODE 20307.00 TO NODE 20307.00 IS CODE = 81
*****************
 FLOW PROCESS FROM NODE 20305.00 TO NODE 20306.00 IS CODE = 54
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                          _____
                                                                           MAINLINE Tc (MIN.) = 31.26
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                           * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.183
SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2190.00
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                      Ap
                                                                                                                             SCS
 CHANNEL LENGTH THRU SUBAREA (FEET) = 801.97 CHANNEL SLOPE = 0.0374
                                                                             LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                           RESIDENTIAL
                                                                           "2 DWELLINGS/ACRE"
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                                              в 1.33 0.75
                                                                                                                       0.700
                                                                                                                              56
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              66.35
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE" B 0.26
 FLOW VELOCITY (FEET/SEC.) = 3.06 FLOW DEPTH (FEET) = 0.66
                                                                                                               0.75
                                                                                                                       0.600
                                                                                                                              56
 TRAVEL TIME (MIN.) = 4.37 Tc (MIN.) = 30.14
                                                                           NATURAL FAIR COVER
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20306.00 = 4557.91 FEET.
                                                                           "OPEN BRUSH"
                                                                                                       3.26
                                                                                                               0.61 1.000
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.896
 FLOW PROCESS FROM NODE 20306.00 TO NODE 20306.00 IS CODE = 81
                                                                           SUBAREA AREA(ACRES) = 4.85 SUBAREA RUNOFF(CFS) = 2.63
                                                                           EFFECTIVE AREA(ACRES) = 114.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.82
______
                                                                           TOTAL AREA (ACRES) = 114.4
                                                                                                        PEAK FLOW RATE(CFS) =
                                                                                                                              66.35
 MAINLINE Tc(MIN.) = 30.14
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.209
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                          Aр
                                                   SCS
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
```

Page 5

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 6

```
*******************
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 FLOW PROCESS FROM NODE 20307.00 TO NODE 20308.00 IS CODE = 54
                                                                             Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
______
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
                                                                              **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
_____
                                                                              ***STREET FLOWING FULL***
 ELEVATION DATA: UPSTREAM(FEET) = 2185.00 DOWNSTREAM(FEET) = 2175.00
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL LENGTH THRU SUBAREA (FEET) = 269.83 CHANNEL SLOPE = 0.0371
                                                                              STREET FLOW DEPTH (FEET) = 0.55
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 20.27
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 4.00
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.58
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             66.35
                                                                              PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.13
 FLOW VELOCITY (FEET/SEC.) = 3.04 FLOW DEPTH (FEET) = 0.66
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 33.68
 TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 32.74
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.131
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20308.00 = 5008.87 FEET.
                                                                            SUBAREA LOSS RATE DATA (AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fρ
*******************
                                                                                LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20308.00 IS CODE = 81
                                                                            NATURAL FAIR COVER
                                                                             "OPEN BRUSH"
                                                                                                 B 1.71
                                                                                                                  0.61
                                                                                                                        1.000
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             RESIDENTIAL
_____
                                                                             "2 DWELLINGS/ACRE" B 2.80
                                                                                                                  0.75
                                                                                                                         0.700
 MAINLINE Tc(MIN.) = 32.74
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.151
                                                                                                                  0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                              Aρ
                                                    SCS
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             SUBAREA AREA (ACRES) = 5.51 SUBAREA RUNOFF (CFS) = 2.94
                                                                            EFFECTIVE AREA(ACRES) = 123.88 AREA-AVERAGED Fm(INCH/HR) = 0.54
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              2.10
                                              0.700 56
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                      0.75
 RESIDENTIAL
                                                                            TOTAL AREA(ACRES) = 123.9 PEAK FLOW RATE(CFS) =
 "3-4 DWELLINGS/ACRE" B
                              0.65
                                      0.75
                                              0.600
                                                    56
                                                                            NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 NATURAL FAIR COVER
                                            1.000
                       В
                             1.26
 "OPEN BRUSH"
                                      0.61
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778
 SUBAREA AREA(ACRES) = 4.01
                           SUBAREA RUNOFF (CFS) = 2.20
                                                                            END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 118.37 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                            DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.81
                                                                            FLOW VELOCITY (FEET/SEC.) = 7.54 DEPTH*VELOCITY (FT*FT/SEC.) = 4.08
 TOTAL AREA (ACRES) = 118.4 PEAK FLOW RATE (CFS) = 66.35
                                                                            LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20309.00 = 5439.79 FEET.
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                           ******************
                                                                             FLOW PROCESS FROM NODE 20309.00 TO NODE 20310.00 IS CODE = 63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                           ______
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*********************
                                                                            >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20308.00 TO NODE 20309.00 IS CODE = 63
                                                                           ______
______
                                                                             UPSTREAM ELEVATION(FEET) = 2150.00 DOWNSTREAM ELEVATION(FEET) = 2140.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                            STREET LENGTH (FEET) = 330.10 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             STREET HALFWIDTH (FEET) = 18.00
______
 UPSTREAM ELEVATION(FEET) = 2175.00 DOWNSTREAM ELEVATION(FEET) = 2150.00
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 430.92 CURB HEIGHT (INCHES) = 6.0
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

SCS

66

56

56

66.35

Date: 04/21/2014 File name: LR0203ZZ.RES Page 7 Date: 04/21/2014 Page 8 File name: LR020377.RFS

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                67.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.62
 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 34.59
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.113
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 Аp
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.69
                                                 0.700
                                         0.75
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                        B 0.85
                                         0.61
                                                1.000
                                                       66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.79
                                        0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.733
 SUBAREA AREA (ACRES) = 5.33 SUBAREA RUNOFF (CFS) = 2.81
 EFFECTIVE AREA(ACRES) = 129.21 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 129.2 PEAK FLOW RATE (CFS) =
                                                         66.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.71
 FLOW VELOCITY (FEET/SEC.) = 6.04 DEPTH*VELOCITY (FT*FT/SEC.) = 3.59
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20310.00 = 5769.89 FEET.
*****************
 FLOW PROCESS FROM NODE 20310.00 TO NODE 20311.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 2140.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
 STREET LENGTH (FEET) = 329.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   68.01
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.59
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.76
 STREET FLOW TRAVEL TIME (MIN.) = 0.57 Tc (MIN.) = 35.16
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.102
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                     в 2.87
 "2 DWELLINGS/ACRE"
                                         0.75
                                                0.700
                                                        56
 NATURAL FAIR COVER
                      B 1.50
                                        0.61 1.000
 "OPEN BRUSH"
                                                        66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.78 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.772
 SUBAREA AREA (ACRES) = 5.15 SUBAREA RUNOFF (CFS) = 2.61
 EFFECTIVE AREA(ACRES) = 134.36 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 134.4 PEAK FLOW RATE (CFS) = 68.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 9.54 DEPTH*VELOCITY (FT*FT/SEC.) = 4.75
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20311.00 = 6099.39 FEET.
*******************
 FLOW PROCESS FROM NODE 20311.00 TO NODE 20312.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2100.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
 STREET LENGTH (FEET) = 476.59 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.61
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   70.57
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 19.23
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.68
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.55
 STREET FLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 36.08
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.086
 SUBAREA LOSS RATE DATA (AMC II):
```

File name: LR0203ZZ.RES

Page 10

Date: 04/21/2014

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL  "2 DWELLINGS/ACRE" B 4.27 0.75 0.700 56 NATURAL FAIR COVER "OPEN BRUSH" B 5.25 0.61 1.000 66 RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.13 0.75 0.600 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.67 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.837 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.837 SUBAREA AREA (ACRES) = 10.65 SUBAREA RUNOFF(CFS) = 5.04 EFFECTIVE AREA (ACRES) = 145.01 AREA-AVERAGED Fm(INCH/HR) = 0.54 AREA-AVERAGED FP(INCH/HR) = 0.67 AREA-AVERAGED AP = 0.81 TOTAL AREA (ACRES) = 145.0 PEAK FLOW RATE(CFS) = 71.05	"3-4 DWELLINGS/ACRE" B 1.19 0.75 0.600 56  NATURAL FAIR COVER  "OPEN BRUSH" B 2.82 0.61 1.000 66  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.770  SUBAREA AREA(ACRES) = 10.46 SUBAREA RUNOFF(CFS) = 4.94  EFFECTIVE AREA(ACRES) = 155.47 AREA-AVERAGED Fm(INCH/HR) = 0.54  AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81  TOTAL AREA(ACRES) = 155.5 PEAK FLOW RATE(CFS) = 73.20  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43  END OF SUBAREA STREET FLOW HYDRAULICS:
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43	DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.28 FLOW VELOCITY(FEET/SEC.) = 6.86 DEPTH*VELOCITY(FT*FT/SEC.) = 4.02 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20313.00 = 7076.27 FEET.
END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.53	**************************************
LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20312.00 = 6575.98 FEET.	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>> (STREET TABLE SECTION # 5 USED) <>>>>
FLOW PROCESS FROM NODE 20312.00 TO NODE 20313.00 IS CODE = 63	UPSTREAM ELEVATION (FEET) = 2040.00 DOWNSTREAM ELEVATION (FEET) = 2020.00
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<	STREET LENGTH(FEET) = 462.82 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00  STREET LENGTH(FEET) = 500.29 CURB HEIGHT(INCHES) = 6.0  STREET HALFWIDTH(FEET) = 18.00	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.73
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 75.58  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.58
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 73.52  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.59  HALFSTREET FLOOD WIDTH(FEET) = 22.35  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.86  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.03	HALFSTREET FLOOD WIDTH(FEET) = 22.22  AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.12  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.16  STREET FLOW TRAVEL TIME(MIN.) = 1.08 Tc(MIN.) = 38.38  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.046  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
STREET FLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 37.29  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.064	NATURAL FAIR COVER "OPEN BRUSH" B 3.76 0.61 1.000 66
SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	RESIDENTIAL "2 DWELLINGS/ACRE" B 5.77 0.75 0.700 56 RESIDENTIAL
RESIDENTIAL "2 DWELLINGS/ACRE" B 6.45 0.75 0.700 56 RESIDENTIAL	"3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.796

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 12

Date: 04/21/2014

File name: LR0203ZZ.RES

```
SUBAREA AREA (ACRES) = 10.63 SUBAREA RUNOFF (CFS) = 4.77
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 166.10 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.81
 TOTAL AREA (ACRES) = 166.1 PEAK FLOW RATE (CFS) = 75.43
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  FLOW VELOCITY (FEET/SEC.) = 8.73 DEPTH*VELOCITY (FT*FT/SEC.) = 4.74
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                  LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20315.00 = 8050.50 FEET.
                                                                                ******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  FLOW PROCESS FROM NODE 20315.00 TO NODE 20316.00 IS CODE = 63
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.22
 FLOW VELOCITY(FEET/SEC.) = 7.11 DEPTH*VELOCITY(FT*FT/SEC.) = 4.15
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20314.00 = 7539.09 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                                ______
 FLOW PROCESS FROM NODE 20314.00 TO NODE 20315.00 IS CODE = 63
                                                                                  UPSTREAM ELEVATION(FEET) = 1980.00 DOWNSTREAM ELEVATION(FEET) = 1950.00
______
                                                                                  STREET LENGTH (FEET) = 522.61 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION (FEET) = 2020.00 DOWNSTREAM ELEVATION (FEET) = 1980.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 511.41 CURB HEIGHT (INCHES) = 6.0
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.67
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 78.93
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
                                                                                   STREET FLOW DEPTH (FEET) = 0.57
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 21.43
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 77.51
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.96
   ***STREET FLOWING FULL***
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.53
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 40.44
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.014
   STREET FLOW DEPTH(FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 20.15
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.76
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.75
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 STREET FLOW TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 39.35
                                                                                  RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.030
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                       B 6.12 0.75 0.700
                                                                                                                                         56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       B 1.25 0.75 0.600
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В 6.85
                                         0.75
                                                 0.700
                                                                                  SUBAREA AREA(ACRES) = 7.37 SUBAREA RUNOFF(CFS) = 3.33
                                                                                  EFFECTIVE AREA(ACRES) = 182.61 AREA-AVERAGED Fm(INCH/HR) = 0.54
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 1.24
                                         0.75
                                               0.600
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.80
                                                       56
                                                                                  TOTAL AREA (ACRES) = 182.6 PEAK FLOW RATE (CFS) = 77.94
 NATURAL FAIR COVER
 "OPEN BRUSH"
                        В
                              1.05
                                        0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.721
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA AREA (ACRES) = 9.14 SUBAREA RUNOFF (CFS) = 4.17
 EFFECTIVE AREA(ACRES) = 175.24 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.80
                                                                                  DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.37
 TOTAL AREA (ACRES) = 175.2 PEAK FLOW RATE (CFS) = 77.26
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.90 DEPTH*VELOCITY (FT*FT/SEC.) = 4.48
                                                                                  LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20316.00 = 8573.11 FEET.
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 13 Date: 04/21/2014 File name: LR0203ZZ.RES Page 14

```
************************
 FLOW PROCESS FROM NODE 20316.00 TO NODE 20317.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
 STREET LENGTH (FEET) = 743.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.62
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 79.19
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 20.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.90
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.84
 STREET FLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 41.84
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.993
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                   Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 4.10 0.75
                                                   0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.55
                                          0.75
                                                  0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.01 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
 SUBAREA AREA (ACRES) = 5.66 SUBAREA RUNOFF (CFS) = 2.50
 EFFECTIVE AREA(ACRES) = 188.27 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 188.3 PEAK FLOW RATE (CFS) = 77.94
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 FLOW VELOCITY (FEET/SEC.) = 8.85 DEPTH*VELOCITY (FT*FT/SEC.) = 4.80
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20317.00 = 9316.69 FEET.
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20317.00 TO NODE 20318.00 IS CODE = 63

Date: 04/21/2014

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.59HALFSTREET FLOOD WIDTH (FEET) = 22.41 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.46 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.39STREET FLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 43.27 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.973 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 RESIDENTIAL ".4 DWELLING/ACRE" B 0.01 0.75 0.900 RESIDENTIAL "2 DWELLINGS/ACRE" B 10.92 0.75 0.700 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691 SUBAREA AREA(ACRES) = 12.03 SUBAREA RUNOFF(CFS) = 4.94 EFFECTIVE AREA(ACRES) = 200.30 AREA-AVERAGED Fm(INCH/HR) = 0.54 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79TOTAL AREA (ACRES) = 200.3 PEAK FLOW RATE (CFS) = 78.67SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.22 FLOW VELOCITY (FEET/SEC.) = 7.41 DEPTH\*VELOCITY (FT\*FT/SEC.) = 4.33 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20318.00 = 9957.32 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20318.00 TO NODE 20319.00 IS CODE = 63 \_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1835.00 STREET LENGTH (FEET) = 624.00 CURB HEIGHT (INCHES) = 8.0 Date: 04/21/2014 File name: LR0203ZZ.RES

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

STREET LENGTH (FEET) = 640.63 CURB HEIGHT (INCHES) = 6.0

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.71

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =

\_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

>>>> (STREET TABLE SECTION # 5 USED) <<<<

INSIDE STREET CROSSFALL(DECIMAL) = 0.020

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

STREET HALFWIDTH (FEET) = 18.00

\*\*\*STREET FLOWING FULL\*\*\*

File name: LR0203ZZ.RES Page 15 Page 16

80.42

SCS

56

56

56

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.78
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 107.91
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.98
 STREET FLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 44.73
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.954
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      gA qT
                                                          SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.46
                                          0.75
                                                   0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 9.05
                                          0.75
                                                   0.900
                                                         56
 RESIDENTIAL
                       B 100.00
 "2 DWELLINGS/ACRE"
                                          0.75
                                                   0.700
                                                         56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 28.82
                                          0.75
                                                  0.700
                                                         56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                         В
                                18.27
                                          0.61 1.000 66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.745
 SUBAREA AREA(ACRES) = 157.60
                              SUBAREA RUNOFF (CFS) = 58.46
 EFFECTIVE AREA(ACRES) = 357.90 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 357.9 PEAK FLOW RATE (CFS) = 133.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74 HALFSTREET FLOOD WIDTH(FEET) = 29.72
 FLOW VELOCITY (FEET/SEC.) = 7.66 DEPTH*VELOCITY (FT*FT/SEC.) = 5.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 624.0 FT WITH ELEVATION-DROP = 25.0 FT, IS 250.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20319.00
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20319.00 = 10581.32 FEET.
******************
 FLOW PROCESS FROM NODE 20319.00 TO NODE 20330.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
```

```
STREET LENGTH (FEET) = 597.75 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 134.16
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.75
   HALFSTREET FLOOD WIDTH (FEET) = 30.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.59
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 46.07
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.937
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.71 0.75
                                                  0.600
                                                          56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 2.91 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.841
 SUBAREA AREA (ACRES) = 3.62 SUBAREA RUNOFF (CFS) = 1.00
 EFFECTIVE AREA(ACRES) = 361.52 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA(ACRES) = 361.5 PEAK FLOW RATE(CFS) = 133.66
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.15
 FLOW VELOCITY (FEET/SEC.) = 7.44 DEPTH*VELOCITY (FT*FT/SEC.) = 5.58
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.
******************
 FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 46.07
 RAINFALL INTENSITY (INCH/HR) = 0.94
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70
 AREA-AVERAGED Ap = 0.77
```

File name: LR0203ZZ.RES

Page 18

Date: 04/21/2014

UPSTREAM ELEVATION(FEET) = 1835.00 DOWNSTREAM ELEVATION(FEET) = 1813.00

```
EFFECTIVE STREAM AREA(ACRES) = 361.52
 TOTAL STREAM AREA(ACRES) = 361.52
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 133.66
*******************
 FLOW PROCESS FROM NODE 20320.00 TO NODE 20321.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1020.45
 ELEVATION DATA: UPSTREAM(FEET) = 2240.00 DOWNSTREAM(FEET) = 2180.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 19.882
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.552
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS Tc
                                     Fр
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      В
                           9.71 0.61 1.000 66 19.88
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA RUNOFF (CFS) = 8.20
 TOTAL AREA (ACRES) = 9.71 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20321.00 TO NODE 20322.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2160.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 548.49 CHANNEL SLOPE = 0.0365
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 1.79 FLOW DEPTH (FEET) = 0.30
 TRAVEL TIME (MIN.) = 5.10 Tc (MIN.) = 24.98
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20322.00 = 1568.94 FEET.
******************
 FLOW PROCESS FROM NODE 20322.00 TO NODE 20322.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 24.98
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.353
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                             Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                          15.34
 "OPEN BRUSH"
                                      0.61
                                             1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                             0.02
                                      0.75
                                             0.700
                                                   56
      Date: 04/21/2014
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.61
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.000
 SUBAREA AREA(ACRES) = 15.36 SUBAREA RUNOFF(CFS) = 10.22
 EFFECTIVE AREA(ACRES) = 25.07 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp (INCH/HR) = 0.61 AREA-AVERAGED Ap = 1.00
 TOTAL AREA(ACRES) = 25.1
                             PEAK FLOW RATE(CFS) =
                                                  16.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20322.00 TO NODE 20323.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 479.58 CHANNEL SLOPE = 0.0209
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             16.69
 FLOW VELOCITY (FEET/SEC.) = 1.73 FLOW DEPTH (FEET) = 0.44
 TRAVEL TIME (MIN.) = 4.63 Tc (MIN.) = 29.61
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20323.00 = 2048.52 FEET.
*******************
 FLOW PROCESS FROM NODE 20323.00 TO NODE 20323.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 29.61
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.222
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 11.74
                                    0.75 0.700
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                          8.32
                                   0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.824
 SUBAREA AREA(ACRES) = 20.06 SUBAREA RUNOFF(CFS) = 11.94
 EFFECTIVE AREA(ACRES) = 45.13 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.64 AREA-AVERAGED Ap = 0.92
 TOTAL AREA(ACRES) = 45.1 PEAK FLOW RATE(CFS) =
                                                  25.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20323.00 TO NODE 20324.00 IS CODE = 54
._____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2100.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 676.85 CHANNEL SLOPE = 0.0739
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
```

Date: 04/21/2014 File name: LR0203ZZ.RES

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.09 FLOW DEPTH (FEET) = 0.41
 TRAVEL TIME (MIN.) = 3.65 Tc (MIN.) = 33.25
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20324.00 = 2725.37 FEET.
*******************
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20324.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 33.25
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.140
 SUBAREA LOSS RATE DATA (AMC II):
                                Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                  B 14.74 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 14.74 SUBAREA RUNOFF (CFS) = 8.18
 EFFECTIVE AREA(ACRES) = 59.87 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 59.9 PEAK FLOW RATE (CFS) = 30.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20324.00 TO NODE 20325.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2080.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 631.62 CHANNEL SLOPE = 0.0317
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            30.50
 FLOW VELOCITY (FEET/SEC.) = 2.36 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 4.46 Tc (MIN.) = 37.71
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20325.00 = 3356.99 FEET.
******************
 FLOW PROCESS FROM NODE 20325.00 TO NODE 20325.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 37.71
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.057
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                        αA
                                               SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 10.91 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 10.91 SUBAREA RUNOFF (CFS) = 5.24
```

```
EFFECTIVE AREA(ACRES) = 70.78 AREA-AVERAGED Fm(INCH/HR) = 0.57
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
 TOTAL AREA(ACRES) = 70.8 PEAK FLOW RATE(CFS) =
                                                   31.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*******************
 FLOW PROCESS FROM NODE 20325.00 TO NODE 20326.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2050.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 686.64 CHANNEL SLOPE = 0.0437
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              31.27
 FLOW VELOCITY (FEET/SEC.) = 2.67 FLOW DEPTH (FEET) = 0.48
 TRAVEL TIME (MIN.) = 4.28 Tc (MIN.) = 41.99
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20326.00 = 4043.63 FEET.
******************
 FLOW PROCESS FROM NODE 20326.00 TO NODE 20326.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 41.99
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.991
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 48.19
                                     0.75
                                            0.700
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.06 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 48.25
                            SUBAREA RUNOFF (CFS) = 20.30
 EFFECTIVE AREA(ACRES) = 119.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 119.0
                              PEAK FLOW RATE(CFS) =
                                                   47.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*******************
 FLOW PROCESS FROM NODE 20326.00 TO NODE 20327.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2050.00 DOWNSTREAM(FEET) = 1990.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1389.79 CHANNEL SLOPE = 0.0432
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 47.37
 FLOW VELOCITY (FEET/SEC.) = 2.94 FLOW DEPTH (FEET) = 0.57
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 22

```
TRAVEL TIME (MIN.) = 7.87 Tc (MIN.) = 49.86
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20327.00 = 5433.42 FEET.
FLOW PROCESS FROM NODE 20327.00 TO NODE 20327.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 49.86
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.894
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 16.19
                                    0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 16.19
                           SUBAREA RUNOFF(CFS) = 5.40
 EFFECTIVE AREA(ACRES) = 135.22 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 135.2
                            PEAK FLOW RATE(CFS) = 47.37
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
FLOW PROCESS FROM NODE 20327.00 TO NODE 20328.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1920.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1079.99 CHANNEL SLOPE = 0.0648
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                             47.37
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.46 FLOW DEPTH (FEET) = 0.52
 TRAVEL TIME (MIN.) = 5.21 Tc (MIN.) = 55.07
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20328.00 = 6513.41 FEET.
*****************
 FLOW PROCESS FROM NODE 20328.00 TO NODE 20328.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 55.07
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.842
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   в 25.33
                                    0.75
                                           0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   в 0.27 0.75
                                           0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699
 SUBAREA AREA (ACRES) = 25.60 SUBAREA RUNOFF (CFS) = 7.36
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
 TOTAL AREA(ACRES) = 160.8
                                 PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*******************
 FLOW PROCESS FROM NODE 20328.00 TO NODE 20329.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1920.00 DOWNSTREAM ELEVATION(FEET) = 1870.00
 STREET LENGTH (FEET) = 1075.25 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.71
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.25
 STREET FLOW TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 57.91
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.817
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                      B 13.84 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 13.84 SUBAREA RUNOFF (CFS) = 3.66
 EFFECTIVE AREA (ACRES) = 174.66 AREA-AVERAGED Fm (INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
 TOTAL AREA (ACRES) = 174.7 PEAK FLOW RATE (CFS) = 47.37
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.56
 FLOW VELOCITY (FEET/SEC.) = 6.21 DEPTH*VELOCITY (FT*FT/SEC.) = 3.18
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20329.00 = 7588.66 FEET.
```

File name: LR020377.RFS

Page 24

Date: 04/21/2014

EFFECTIVE AREA(ACRES) = 160.82 AREA-AVERAGED Fm(INCH/HR) = 0.54

```
******************
 FLOW PROCESS FROM NODE 20329.00 TO NODE 20330.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1870.00 DOWNSTREAM ELEVATION(FEET) = 1813.00
 STREET LENGTH (FEET) = 927.52 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               49.17
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.42
 STREET FLOW TRAVEL TIME (MIN.) = 2.26 Tc (MIN.) = 60.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.799
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.48
                                       0.75
                                               0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                       B 5.88
                                       0.75
                                               0.900
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                             11.27
                                       0.75
                                               0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764
 SUBAREA AREA (ACRES) = 17.63 SUBAREA RUNOFF (CFS) = 3.60
 EFFECTIVE AREA(ACRES) = 192.29 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.76
 TOTAL AREA (ACRES) = 192.3
                               PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 6.76 DEPTH*VELOCITY (FT*FT/SEC.) = 3.34
 LONGEST FLOWPATH FROM NODE 20320.00 TO NODE 20330.00 = 8516.18 FEET.
FLOW PROCESS FROM NODE 20330.00 TO NODE 20330.00 IS CODE = 1
```

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES << < <

TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 60.17 RAINFALL INTENSITY (INCH/HR) = 0.80AREA-AVERAGED Fm(INCH/HR) = 0.54AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.76EFFECTIVE STREAM AREA(ACRES) = 192.29 TOTAL STREAM AREA(ACRES) = 192.29 PEAK FLOW RATE (CFS) AT CONFLUENCE = 47.37

\*\* CONFLUENCE DATA \*\*

STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 133.66 46.07 0.937 0.70(0.54) 0.77 361.5 20300.00 47.37 60.17 0.799 0.72(0.54) 0.76 192.3 20320.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Тc	Intensity	Fp(Fm)	Аp	Аe	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	181.03	46.07	0.937	0.71(0.54)	0.77	508.8	20300.00
2	134.35	60.17	0.799	0.71(0.54)	0.77	553.8	20320.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE (CFS) = 181.03 Tc (MIN.) = 46.07

EFFECTIVE AREA(ACRES) = 508.75 AREA-AVERAGED Fm(INCH/HR) = 0.54

AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77

TOTAL AREA(ACRES) = 553.8

LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20330.00 = 11179.07 FEET.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20330.00 TO NODE 20349.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 18 USED) <<<<

\_\_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1813.00 DOWNSTREAM ELEVATION(FEET) = 1785.00 STREET LENGTH (FEET) = 1334.61 CURB HEIGHT (INCHES) = 8.0

STREET HALFWIDTH (FEET) = 26.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\*

STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

```
STREET FLOW DEPTH (FEET) = 0.89
   HALFSTREET FLOOD WIDTH (FEET) = 37.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.98
 STREET FLOW TRAVEL TIME (MIN.) = 3.30 Tc (MIN.) = 49.37
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.899
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
  DEVELOPMENT TYPE/
                                        Fρ
                                                 Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.05 0.75 0.600 56
 RESIDENTIAL
                      B 12.65 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA AREA(ACRES) = 13.70
                             SUBAREA RUNOFF (CFS) = 4.70
 EFFECTIVE AREA(ACRES) = 522.45 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.76
 TOTAL AREA(ACRES) = 567.5
                                PEAK FLOW RATE (CFS) = 181.03
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88 HALFSTREET FLOOD WIDTH(FEET) = 36.86
 FLOW VELOCITY (FEET/SEC.) = 6.72 DEPTH*VELOCITY (FT*FT/SEC.) = 5.94
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
******************
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 49.37
 RAINFALL INTENSITY (INCH/HR) = 0.90
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.76
 EFFECTIVE STREAM AREA(ACRES) = 522.45
 TOTAL STREAM AREA(ACRES) = 567.51
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 181.03
********************
 FLOW PROCESS FROM NODE 20340.00 TO NODE 20341.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 998.88
 ELEVATION DATA: UPSTREAM(FEET) = 2120.00 DOWNSTREAM(FEET) = 2080.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.422
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.058
 SUBAREA TC AND LOSS RATE DATA (AMC II):
```

LAND USE			- L	I-		
TIMD OOD	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
RESIDENTIAL						
"2 DWELLINGS/ACRE"	В	6.76	0.75	0.700	56	13.21
RESIDENTIAL	2	0.70	0.,0	0.,00		10.21
"3-4 DWELLINGS/ACRE"	Б	1 10	0.75	0 600	E 6	10 40
					50	12.42
SUBAREA AVERAGE PERVIOU				. /5		
SUBAREA AVERAGE PERVIOU		ACTION, A <sub>l</sub>	p = 0.686			
SUBAREA RUNOFF(CFS) =	10.96					
TOTAL AREA (ACRES) =	7.88	PEAK FLOW	RATE (CFS)	= 10.9	6	
SUBAREA AREA-AVERAGED R	ATNEALL D	EPTH (TNCH	) •			
5M = 0.30; 30M = 0.61;				2 06. 244	D = 1	13
3H - 0.30, 30H - 0.01,	IIIX - 0.0	o, 31110	1.45, 0111	2.00, 2411	11 - 1.	. 13
*****						
						******
FLOW PROCESS FROM NODE						
>>>>COMPUTE TRAPEZOIDA	L CHANNEL	FLOW<<<	<			
>>>>TRAVELTIME THRU SU	BAREA (EX	ISTING EL	EMENT) <<<<			
					=====	======
ELEVATION DATA: UPSTREA						
CHANNEL LENGTH THRU SUB						
				FT STORE =	0.00	029
CHANNEL BASE (FEET) =						
MANNING'S FACTOR = 0.04				.00		
CHANNEL FLOW THRU SUBAR						
FLOW VELOCITY (FEET/SEC.	) = 2.4	0 FLOW 1	DEPTH (FEET)	= 0.30		
TRAVEL TIME (MIN.) = 2						
LONGEST FLOWPATH FROM N	,	,		00 = 13	96 14	FEET
HONORDI I HOWITTIII I KOTI N	000 2001	0.00 10 10	000 20012.	00 13	JU.11	
******						
FLOW PROCESS FROM NODE	20342.00	TO NODE	20342 00 T	S CODE =	8.1	
>>>>ADDITION OF SUBARE	A TO MAIN	LINE PEAK	FLOW<<<<			
>>>>ADDITION OF SUBARE	A TO MAIN	LINE PEAK	FLOW<<<<			
>>>>ADDITION OF SUBARE	A TO MAIN	LINE PEAK	FLOW<<<<			
>>>>ADDITION OF SUBARE	A TO MAIN:	LINE PEAK	FLOW<<<<			
>>>>ADDITION OF SUBARE  MAINLINE Tc(MIN.) = 1  * 10 YEAR RAINFALL INT		LINE PEAK ======== CH/HR) =	FLOW<<<<			
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(	A TO MAIN: ====================================	LINE PEAK ======== CH/HR) =	FLOW<<<<			
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/	A TO MAIN: ====================================	LINE PEAK ====================================	FLOW<<<< 1.825	  Ap	 ====== SCS	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/	A TO MAIN: ====================================	LINE PEAK ====================================	FLOW<<<< 1.825	  Ap	 ====== SCS	
>>>>ADDITION OF SUBARE  ===================================	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)	FLOW<><< 1.825 Fp (INCH/HR)	Ap (DECIMAL)	SCS	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE"	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)	FLOW<><< 1.825 Fp (INCH/HR)	Ap (DECIMAL)	SCS	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL	A TO MAIN: ====================================	LINE PEAK CH/HR) = AREA (ACRES) 4.25	FLOW<>>> 1.825     Fp (INCH/HR)     0.75	Ap (DECIMAL)	SCS CN	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE"	A TO MAIN: ====================================	LINE PEAK CH/HR) = AREA (ACRES) 4.25	FLOW<>>> 1.825     Fp (INCH/HR)     0.75	Ap (DECIMAL)	SCS CN	
>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE"	A TO MAIN: 5.18 ENSITY(IN: AMC II): SCS SOIL GROUP B B	LINE PEAK ====================================	FLOW<>>> 1.825     Fp (INCH/HR)     0.75     0.75	Ap (DECIMAL) 0.700 0.600	SCS CN	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU	A TO MAIN:  5.18 ENSITY(IN: AMC II): SCS SOIL GROUP  B  B  S LOSS RA'	LINE PEAK	FLOW<>>>  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0	Ap (DECIMAL) 0.700 0.600	SCS CN	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU	A TO MAIN:  5.18 ENSITY(INGAMC II): SCS SOIL GROUP  B  B S LOSS RA'S AREA FR'S	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INA ACTION, A)	FLOW<<<<< 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694	Ap (DECIMAL) 0.700 0.600	SCS CN 56	
>>>> ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU	A TO MAIN:  5.18 ENSITY(ING AMC II): SCS SOIL GROUP  B  B  S LOSS RA' S AREA FR. 4.50	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBARE	FLOW<<<<< 1.825 Fp (INCH/HR) 0.75 0.75 CH/HR) = 0 p = 0.694 A RUNOFF (CF	Ap (DECIMAL) 0.700 0.600 .75	SCS CN 56 56	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) =	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP B B S LOSS RA'S AREA FR. 4.50 12.3	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INA ACTION, A) SUBAREI 8 AREA-2	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.	SCS CN 56 56	
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA'S AREA FR. 4.50 12.33 R) = 0.7	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INA ACTION, A) SUBAREI 8 AREA-A	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED AP	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.6(INCH/HR) = 0.69	SCS CN 56 56	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) =	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA'S AREA FR. 4.50 12.33 R) = 0.7	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INA ACTION, A) SUBAREI 8 AREA-A	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED AP	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.6(INCH/HR) = 0.69	SCS CN 56 56	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA'S AREA FR. 4.50 12.33 R) = 0.7	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INA ACTION, A) SUBAREI 8 AREA-A	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED AP	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.6(INCH/HR) = 0.69	SCS CN 56 56	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA'S AREA FR. 4.50 12.33 R) = 0.7	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(INA ACTION, Ap SUBARE, 8 AREA-A PEAK	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED FM VERAGED AP FLOW RATE(	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.6(INCH/HR) = 0.69	SCS CN 56 56	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA(ACRES) =	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA' S AREA FRA 4.50 12.33 R) = 0.7 12.4 AINFALL DI	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBARE, 8 AREA-A PEAK  EPTH(INCH	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF (CF AVERAGED FM VERAGED FM VERAGED AP FLOW RATE (	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.(INCH/HR) = 0.69 CFS) =	SCS CN 56 56 29 = 0.5	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA(ACRES) = SUBAREA AREA-AVERAGED R	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA' S AREA FRA 4.50 12.33 R) = 0.7 12.4 AINFALL DI	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBARE, 8 AREA-A PEAK  EPTH(INCH	FLOW<<<<  1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF (CF AVERAGED FM VERAGED FM VERAGED AP FLOW RATE (	Ap (DECIMAL) 0.700 0.600 .75 (S) = 5.(INCH/HR) = 0.69 CFS) =	SCS CN 56 56 29 = 0.5	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA(ACRES) = SUBAREA AREA-AVERAGED R	A TO MAIN:  5.18 ENSITY(INAMC II): SCS SOIL GROUP  B  B S LOSS RA' S AREA FR 4.50 12.3 R) = 0.7 12.4  AINFALL DI 1HR = 0.8	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INM ACTION, AJ SUBAREA 5 AREA-A PEAK  EPTH(INCH 0; 3HR = 1	FLOW<<<<<	Ap (DECIMAL) 0.700 0.600 .75 S) = 5. (INCH/HR) = 0.69 CFS) =	SCS CN 56 56 56 14.5	52
>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "2 DWELLINGS/ACRE" RESIDENTIAL  "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED FP(INCH/H TOTAL AREA(ACRES) =  SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61;	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, FP(INO ACTION, AJ SUBARE, 8 AREA-A PEAK  EPTH(INCH 0; 3HR =	FLOW<<<<< ================================	Ap (DECIMAL) 0.700 0.600 .75 S) = 5. (INCH/HR) = 0.69 CFS) = 2.06; 24H	SCS CN 56 56 14.5 R = 4.	52
MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) = SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61; ************************************	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBARE: 8 AREA-1 5 AREA-A' PEAK  EPTH(INCH 0; 3HR = ::  *********************************	FLOW<-<<- 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED FM VERAGED AP FLOW RATE( ): 1.43; 6HR = ************************************	Ap (DECIMAL) 0.700 0.600 .75 S) = 5.(INCH/HR) = 0.69 CFS) = 2.06; 24H *********** S CODE =	SCS CN 56 56 29 = 0.5 14.5 R = 4.	52 59 43
MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) = SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61; ************************************	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(INCA ACTION, AJ SUBAREA 8 AREA-1 5 AREA-A PEAK  EPTH(INCH 0; 3HR = 100000000000000000000000000000000000	FLOW<-<<- 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERACED FM VERAGED AP FLOW RATE(  ): 1.43; 6HR = ************ 20343.00 I	Ap (DECIMAL) 0.700 0.600 .75 S) = 5.(INCH/HR) = 0.69 CFS) = 2.06; 24H *********** S CODE =	SCS CN 56 56 29 = 0.5 14.5 R = 4.	52 59 43
MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) = SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61; ************************************	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(INCA ACTION, AJ SUBAREA 8 AREA-1 5 AREA-A PEAK  EPTH(INCH 0; 3HR = 100000000000000000000000000000000000	FLOW<-<<- 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERACED FM VERAGED AP FLOW RATE(  ): 1.43; 6HR = ************ 20343.00 I	Ap (DECIMAL) 0.700 0.600 .75 S) = 5.(INCH/HR) = 0.69 CFS) = 2.06; 24H *********** S CODE =	SCS CN 56 56 29 = 0.5 14.5 R = 4.	52 59 43
MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE AREA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) = SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61; ************************************	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBAREJ 8 AREA-1 5 AREA-A' PEAK  EPTH (INCH 0; 3HR = 100000000000000000000000000000000000	FLOW<<<<< 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED AP FLOW RATE(  ): 1.43; 6HR =  ************* 20343.00 I	Ap (DECIMAL) 0.700 0.600 .75 S) = 5. (INCH/HR) = 0.69 CFS) = 2.06; 24H ********* S CODE =	SCS CN 56 56 29 = 0.5 14.5 R = 4.	52 59 43
MAINLINE TC (MIN.) = 1 * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU SUBAREA AREA (ACRES) = EFFECTIVE ARBA (ACRES) = AREA-AVERAGED FP (INCH/H TOTAL AREA (ACRES) = SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61; ************************************	A TO MAIN: ====================================	LINE PEAK  CH/HR) =  AREA (ACRES)  4.25  0.25  TE, Fp(ING ACTION, AJ SUBAREJ 8 AREA-1 5 AREA-A' PEAK  EPTH (INCH 0; 3HR = 100000000000000000000000000000000000	FLOW<<<<< 1.825  Fp (INCH/HR)  0.75  0.75  CH/HR) = 0 p = 0.694 A RUNOFF(CF AVERAGED FM VERAGED AP FLOW RATE(  ): 1.43; 6HR =  ************* 20343.00 I	Ap (DECIMAL) 0.700 0.600 .75 S) = 5. (INCH/HR) = 0.69 CFS) = 2.06; 24H ********* S CODE =	SCS CN 56 56 29 = 0.5 14.5 R = 4.	52 59 43

SCS SOIL AREA

Fр

Date: 04/21/2014

DEVELOPMENT TYPE/

File name: LR0203ZZ.RES

SCS Tc

Αp

```
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
_____
                                                                              LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2035.00
                                                                           RESIDENTIAL
 CHANNEL LENGTH THRU SUBAREA (FEET) = 438.38 CHANNEL SLOPE = 0.0456
                                                                          "2 DWELLINGS/ACRE"
                                                                                              B
                                                                                                       2.06
                                                                                                               0.75
                                                                                                                      0.700
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                          ".4 DWELLING/ACRE"
                                                                                                B 2.77
                                                                                                               0.75
                                                                                                                      0.900
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                          RESIDENTIAL
                             14.59
                                                                                                     0.07 0.75 0.600
 FLOW VELOCITY (FEET/SEC.) = 2.23 FLOW DEPTH (FEET) = 0.36
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                              В
 TRAVEL TIME (MIN.) = 3.27 Tc (MIN.) = 18.45
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20343.00 = 1834.52 FEET.
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.812
                                                                                                     SUBAREA RUNOFF (CFS) = 3.74
                                                                          SUBAREA AREA(ACRES) = 4.90
******************
                                                                          EFFECTIVE AREA(ACRES) = 23.02 AREA-AVERAGED Fm(INCH/HR) = 0.54
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20343.00 IS CODE = 81
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
                                                                          TOTAL AREA (ACRES) = 23.0
                                                                                                       PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 MAINLINE Tc(MIN.) = 18.45
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.623
                                                                         ******************
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                           FLOW PROCESS FROM NODE 20344.00 TO NODE 20345.00 IS CODE = 54
                                     Fρ
                                             αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         _______
     LAND USE
 RESIDENTIAL
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "2 DWELLINGS/ACRE"
                             5.37
                                     0.75
                                            0.700
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 RESIDENTIAL
                                                                         _____
 "3-4 DWELLINGS/ACRE" B 0.37
                                     0.75
                                           0.600
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 2015.00 DOWNSTREAM(FEET) = 1980.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 575.06 CHANNEL SLOPE = 0.0609
                                                                          CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA(ACRES) = 5.74
                            SUBAREA RUNOFF (CFS) = 5.70
                                                                          MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 EFFECTIVE AREA(ACRES) = 18.12 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                          CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                      19.07
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                          FLOW VELOCITY (FEET/SEC.) = 2.69 FLOW DEPTH (FEET) = 0.38
                                                                          TRAVEL TIME (MIN.) = 3.57 Tc (MIN.) = 25.68
 TOTAL AREA(ACRES) = 18.1 PEAK FLOW RATE(CFS) =
                                                   18.05
                                                                          LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20345.00 = 2906.30 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         ******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                           FLOW PROCESS FROM NODE 20345.00 TO NODE 20345.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 20343.00 TO NODE 20344.00 IS CODE = 54
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          MAINLINE Tc(MIN.) = 25.68
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                           * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.331
_____
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2015.00
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fр
                                                                                                                      Αp
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.72 CHANNEL SLOPE = 0.0403
                                                                             LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                          RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                          "2 DWELLINGS/ACRE"
                                                                                               В 12.00
                                                                                                               0.75
                                                                                                                      0.700
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             18.05
                                                                           RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                               B 0.27
                                                                                                               0.75
                                                                                                                      0.600
 FLOW VELOCITY (FEET/SEC.) = 2.26 FLOW DEPTH (FEET) = 0.40
 TRAVEL TIME (MIN.) = 3.66 Tc (MIN.) = 22.12
                                                                          RESIDENTIAL
                                                                                              В
                                                                                                     3.29
                                                                                                               0.75 0.900
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20344.00 = 2331.24 FEET.
                                                                           ".4 DWELLING/ACRE"
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
******************
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
 FLOW PROCESS FROM NODE 20344.00 TO NODE 20344.00 IS CODE = 81
                                                                           SUBAREA AREA(ACRES) = 15.56
                                                                                                      SUBAREA RUNOFF (CFS) = 10.88
                                                                          EFFECTIVE AREA(ACRES) = 38.58 AREA-AVERAGED Fm(INCH/HR) = 0.54
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                           TOTAL AREA (ACRES) = 38.6
______
                                                                                                       PEAK FLOW RATE(CFS) =
 MAINLINE Tc(MIN.) = 22.12
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.456
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA(AMC II):
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
```

Page 29

Date: 04/21/2014

File name: LR020377.RFS

Date: 04/21/2014 File name: LR0203ZZ.RES

56

19.07

56

56

27.36

Page 30

```
******************
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20345.00 TO NODE 20346.00 IS CODE = 54
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                                STREET FLOW DEPTH (FEET) = 0.46
 ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1940.00
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 16.48
 CHANNEL LENGTH THRU SUBAREA (FEET) = 558.59 CHANNEL SLOPE = 0.0716
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.64
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.57
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                               STREET FLOW TRAVEL TIME (MIN.) = 2.94 Tc (MIN.) = 31.57
 CHANNEL FLOW THRU SUBAREA(CFS) = 27.36
                                                                               * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.176
 FLOW VELOCITY (FEET/SEC.) = 3.15 FLOW DEPTH (FEET) = 0.42
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 TRAVEL TIME (MIN.) = 2.96 Tc (MIN.) = 28.64
                                                                               DEVELOPMENT TYPE/
                                                                                                 SCS SOIL AREA
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20346.00 = 3464.89 FEET.
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   LAND USE
                                                                               RESIDENTIAL
*****************
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                  в 2.71
 FLOW PROCESS FROM NODE 20346.00 TO NODE 20346.00 IS CODE = 81
                                                                               RESIDENTIAL
                                                                               "2 DWELLINGS/ACRE"
                                                                                                   B 6.04
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                               RESIDENTIAL
                                                                                                   B 1.62 0.75 0.900
_____
                                                                               ".4 DWELLING/ACRE"
 MAINLINE Tc(MIN.) = 28.64
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.247
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               SUBAREA AREA(ACRES) = 10.37 SUBAREA RUNOFF(CFS) = 6.05
                                      Fр
                                                                               EFFECTIVE AREA(ACRES) = 56.51 AREA-AVERAGED Fm(INCH/HR) = 0.55
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                               Дp
                                                      SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                               TOTAL AREA (ACRES) = 56.5 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
                                               0.700
 "2 DWELLINGS/ACRE" B
                               3.53
                                       0.75
                                                     56
 RESIDENTIAL
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "3-4 DWELLINGS/ACRE"
                              0.62
                                       0.75
                                               0.600
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                       В
                                                      56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В
                             3.41
                                               0.900
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
                                       0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.55
                                                                               FLOW VELOCITY (FEET/SEC.) = 5.61 DEPTH*VELOCITY (FT*FT/SEC.) = 2.56
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.782
 SUBAREA AREA(ACRES) = 7.56
                              SUBAREA RUNOFF (CFS) = 4.50
                                                                               LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20347.00 = 4458.51 FEET.
 EFFECTIVE AREA(ACRES) = 46.14 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                             ******************
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 46.1
                              PEAK FLOW RATE (CFS) =
                                                                               FLOW PROCESS FROM NODE 20347.00 TO NODE 20348.00 IS CODE = 63
                                                      28.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                              >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             ______
******************
                                                                               UPSTREAM ELEVATION(FEET) = 1890.00 DOWNSTREAM ELEVATION(FEET) = 1860.00
                                                                               STREET LENGTH (FEET) = 874.50 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20346.00 TO NODE 20347.00 IS CODE = 63
                                                                               STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
_____
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1940.00 DOWNSTREAM ELEVATION(FEET) = 1890.00
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 993.62 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

Page 31

Date: 04/21/2014

File name: LR0203ZZ.RES

35.66 Date: 04/21/2014 File name: LR0203ZZ.RES Page 32

31.96

0.600

0.700

56

56

32.05

Fр

0.75

0.75

```
STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.06
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.51
 STREET FLOW TRAVEL TIME (MIN.) = 2.88 Tc (MIN.) = 34.45
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.116
 SUBAREA LOSS RATE DATA (AMC II):
                   SCS SOIL AREA
  DEVELOPMENT TYPE/
                                        Fρ
                                                 Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.78 0.75 0.600 56
 RESIDENTIAL
                      B 12.66 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA (ACRES) = 13.44 SUBAREA RUNOFF (CFS) = 7.22
 EFFECTIVE AREA(ACRES) = 69.95 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 TOTAL AREA(ACRES) = 69.9 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.50 HALFSTREET FLOOD WIDTH (FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 5.08 DEPTH*VELOCITY (FT*FT/SEC.) = 2.53
 LONGEST FLOWPATH FROM NODE 20340.00 TO NODE 20348.00 = 5333.01 FEET.
******************
 FLOW PROCESS FROM NODE 20348.00 TO NODE 20349.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1785.00
 STREET LENGTH (FEET) = 1082.38 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.30
 STREET FLOW TRAVEL TIME (MIN.) = 2.62 Tc (MIN.) = 37.08
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.068
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
```

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
RESIDENTIAL "2 DWELLINGS/ACRE"	В	33.09	0.75	0.700	56
RESIDENTIAL "3-4 DWELLINGS/ACRE" SUBAREA AVERAGE PERVIOU SUBAREA AVERAGE PERVIOU	S LOSS RAT S AREA FRA	E, Fp(ING ACTION, Ap	CH/HR) = 0 CH/HR) = 0.698	.75	
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H TOTAL AREA(ACRES) =	103.59 $R) = 0.75$	AREA-AV	-AVERAGED F. /ERAGED Ap	m(INCH/HR) = 0.71	= 0.53
SUBAREA AREA-AVERAGED R 5M = 0.30; 30M = 0.61;				2.06; 24HF	R = 4.43
END OF SUBAREA STREET F DEPTH(FEET) = 0.49 HA FLOW VELOCITY(FEET/SEC. LONGEST FLOWPATH FROM N	LFSTREET E	LOOD WID: **DEPTH	/ELOCITY (FT	*FT/SEC.) =	
**************************************	20349.00	TO NODE	20349.00 I	S CODE =	
>>>>DESIGNATE INDEPEND	ENT STREAM S CONFLUEM	1 FOR CONI	FLUENCE<<<< AM VALUES<<	< <<<	
TOTAL NUMBER OF STREAMS CONFLUENCE VALUES USED TIME OF CONCENTRATION (M RAINFALL INTENSITY (INCH AREA-AVERAGED FM (INCH/H AREA-AVERAGED AP = 0.7 EFFECTIVE STREAM AREA (A TOTAL STREAM AREA (ACRES PEAK FLOW RATE (CFS) AT	FOR INDEPE IN.) = 3 /HR) = 1 R) = 0.53 R) = 0.75 1 CRES) = ) = 10	37.08 07 3 5 103.59		:	
** CONFLUENCE DATA **	Intensi	tv Fn(1	īm) An	Ae	HEADWATER
STREAM Q TC NUMBER (CFS) (MIN 1 181.03 49. 1 134.35 63. 2 49.70 37.	.) (INCH/F 37 0.89 77 0.77 08 1.06	IR) (INCH, 99 0.71( 71 0.71( 58 0.75(	/HR) 0.54) 0.76 0.54) 0.76 0.53) 0.71	(ACRES) 522.5 567.5 103.6	NODE 20300.00 20320.00 20340.00
RAINFALL INTENSITY AND CONFLUENCE FORMULA USED			ION RATIO		
** PEAK FLOW RATE TABLE STREAM Q TC NUMBER (CFS) (MIN 1 230.73 37. 2 215.01 49. 3 156.40 63.	Intensi .) (INCH/H 08 1.06	IR) (INCH, 58 0.72( 99 0.71(	/HR) 0.54) 0.75 0.54) 0.76	(ACRES) 495.9 626.0	NODE 20340.00 20300.00
COMPUTED CONFLUENCE EST PEAK FLOW RATE(CFS) = EFFECTIVE AREA(ACRES) = AREA-AVERAGED Fp(INCH/H	230.73 495.9	Tc (MII 3 AREA-	N.) = 37 -AVERAGED F	m(INCH/HR)	= 0.54

Date: 04/21/2014

```
DEVELOPMENT TYPE/
                                                                                                           SCS SOIL AREA
 TOTAL AREA (ACRES) =
                     671.1
                                                                                                                               Fр
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
                                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                          LAND USE
                                                                                      RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 4.52
                                                                                                                               0.75 0.600
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20349.00 IS CODE = 71
                                                                                      RESIDENTIAL
                                                                                                            в 72.05
                                                                                      ".4 DWELLING/ACRE"
                                                                                                                               0.75 0.900
                                                                                      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
                                                                                      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.882
_____
                                                                                      UNIT-HYDROGRAPH DATA:
 UNIT-HYDROGRAPH DATA:
                                                                                      RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
                                                                                      S-GRAPH: VALLEY (DEV.) = 68.9%; VALLEY (UNDEV.) / DESERT= 31.1%
 S-GRAPH: VALLEY(DEV.) = 76.1%; VALLEY(UNDEV.) / DESERT = 23.9%
                                                                                              MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                                      Tc(HR) = 0.85; LAG(HR) = 0.68; Fm(INCH/HR) = 0.55; Ybar = 0.63
 Tc(HR) = 0.82; LAG(HR) = 0.66; Fm(INCH/HR) = 0.54; Ybar = 0.61
                                                                                      USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                      DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                      3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                                      UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 671.1
                                                                                      LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 12513.68 FEET.
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20349.00 = 12513.68 FEET.
                                                                                      EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                      Lca/L=0.3,n=.0719; Lca/L=0.4,n=.0645; Lca/L=0.5,n=.0592; Lca/L=0.6,n=.0553
  Lca/L=0.3,n=.0682; Lca/L=0.4,n=.0612; Lca/L=0.5,n=.0562; Lca/L=0.6,n=.0524
                                                                                      TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 112.06
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 103.64
                                                                                      UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 364.55
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 344.48
                                                                                      TOTAL AREA (ACRES) = 747.7
                                                                                                                        PEAK FLOW RATE(CFS) =
 TOTAL PEAK FLOW RATE (CFS) = 344.48 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 230.73
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                      5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 230.73)
 PEAK FLOW RATE (CFS) USED = 344.48
                                                                                      END OF SUBAREA STREET FLOW HYDRAULICS:
*******************
                                                                                      DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 39.19
 FLOW PROCESS FROM NODE 20349.00 TO NODE 20350.00 IS CODE = 63
                                                                                      FLOW VELOCITY (FEET/SEC.) = 11.59 DEPTH*VELOCITY (FT*FT/SEC.) = 10.71
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                      *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                            THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
______
                                                                                      SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 UPSTREAM ELEVATION(FEET) = 1785.00 DOWNSTREAM ELEVATION(FEET) = 1715.00
                                                                                      ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 STREET LENGTH (FEET) = 1290.16 CURB HEIGHT (INCHES) = 6.0
                                                                                      ESTIMATED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 STREET HALFWIDTH (FEET) = 18.00
                                                                                      ASSUME FULL-FLOWING PIPELINE
                                                                                      PIPE-FLOW VELOCITY(FEET/SEC.) = 23.49
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                      PIPE-FLOW(CFS) = 259.72
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.92 Tc (MIN.) = 50.29
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      UNIT-HYDROGRAPH DATA:
                                                                                      RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                      S-GRAPH: VALLEY(DEV.) = 68.9%; VALLEY(UNDEV.) / DESERT = 31.1%
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                              MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                      Tc(HR) = 0.82; LAG(HR) = 0.66; Fm(INCH/HR) = 0.55; Ybar = 0.63
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                      USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
                                                                                      DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
                                                                                      3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                                      UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 747.7
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
                                                                                      LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20350.00 = 13803.84 FEET.
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                      EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   STREET FLOW DEPTH(FEET) = 0.91
                                                                                      Lca/L=0.3, n=.0631; Lca/L=0.4, n=.0566; Lca/L=0.5, n=.0520; Lca/L=0.6, n=.0485
   HALFSTREET FLOOD WIDTH (FEET) = 38.64
                                                                                      TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 112.06
                                                                                      TOTAL AREA (ACRES) = 747.7
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.51
                                                                                                                      PEAK FLOW RATE(CFS) =
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 10.50
 STREET FLOW TRAVEL TIME (MIN.) = 1.87 Tc (MIN.) = 51.24
                                                                                      SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.879
                                                                                      5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                      STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
```

Page 35

Date: 04/21/2014

File name: LR020377.RFS

Date: 04/21/2014 File name: LR0203ZZ.RES Page 36

SCS

56

56

364.55

363.38

Αр

```
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 103.66
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.25
FLOW PROCESS FROM NODE 20350.00 TO NODE 20351.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1680.00
 STREET LENGTH (FEET) = 1342.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 370.93
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.05
   HALFSTREET FLOOD WIDTH (FEET) = 45.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.21
 STREET FLOW TRAVEL TIME (MIN.) = 2.56 Tc (MIN.) = 52.85
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.863
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                       SCS SOIL AREA
                                          Fρ
                                                    αA
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                               7.14
                                           0.75
                                                   0.600
                                                         56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                        В
                                72.56
                                        0.75
                                                   0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.873
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 S-GRAPH: VALLEY(DEV.) = 63.2%; VALLEY(UNDEV.) / DESERT = 36.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.88; LAG(HR) = 0.70; Fm(INCH/HR) = 0.56; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 827.4
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 13803.84 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0681; Lca/L=0.4,n=.0610; Lca/L=0.5,n=.0561; Lca/L=0.6,n=.0523
```

```
TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 121.01
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 827.4 PEAK FLOW RATE(CFS) =
                                                            388.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.07 HALFSTREET FLOOD WIDTH(FEET) = 46.45
 FLOW VELOCITY (FEET/SEC.) = 8.84 DEPTH*VELOCITY (FT*FT/SEC.) = 9.46
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.40
 PIPE-FLOW(CFS) = 292.82
 PIPEFLOW TRAVEL TIME (MIN.) = 1.22 Tc (MIN.) = 51.50
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 S-GRAPH: VALLEY(DEV.) = 63.2%; VALLEY(UNDEV.) / DESERT = 36.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.56; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20351.00 = 15145.87 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0593; Lca/L=0.4,n=.0532; Lca/L=0.5,n=.0489; Lca/L=0.6,n=.0456
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 121.01
 TOTAL AREA (ACRES) = 827.4 PEAK FLOW RATE (CFS) = 391.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 98.72
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.36
******************
 FLOW PROCESS FROM NODE 20351.00 TO NODE 20352.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1680.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 1091.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 37

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 38

```
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.87

SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:

** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **

ESTIMATED PIPE DIAMETER(INCH) = 57.00 NUMBER OF PIPES = 1

ASSUME FULL-FLOWING PIPELINE

PIPE-FLOW VELOCITY(FEET/SEC.) = 17.88

PIPE-FLOW(CFS) = 317.05
```

```
PIPEFLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 52.52
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
 S-GRAPH: VALLEY(DEV.) = 62.0%; VALLEY(UNDEV.)/DESERT= 38.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.56; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0572; Lca/L=0.4,n=.0512; Lca/L=0.5,n=.0471; Lca/L=0.6,n=.0439
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 122.80
 TOTAL AREA (ACRES) = 843.8 PEAK FLOW RATE (CFS) = 394.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 77.70
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.65
  HALFSTREET FLOOD WIDTH (FEET) = 25.34
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.73
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.70
******************
 FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
****************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20274.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1378.41 Tc (MIN.) = 44.78
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.65
 TOTAL AREA (ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
*******************
 FLOW PROCESS FROM NODE 20274.00 TO NODE 20274.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1378.41 Tc (MIN.) = 44.78
 AREA-AVERAGED Fm(INCH/HR) = 0.59 Ybar = 0.65
 TOTAL AREA (ACRES) = 3101.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20274.00 = 19473.89 FEET.
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 39 Date: 04/21/2014 File name: LR0203ZZ.RES Page 40

FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 11 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY \_\_\_\_\_ \*\* MAIN STREAM CONFLUENCE DATA \*\* PEAK FLOW RATE (CFS) = 1381.80 Tc (MIN.) = 45.18AREA-AVERAGED Fm (INCH/HR) = 0.59 Ybar = 0.65TOTAL AREA (ACRES) = 3135.5 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET. \*\* MEMORY BANK # 1 CONFLUENCE DATA \*\* PEAK FLOW RATE(CFS) = 394.75 Tc(MIN.) = 52.52AREA-AVERAGED Fm(INCH/HR) = 0.56 Ybar = 0.64843.8 TOTAL AREA (ACRES) = LONGEST FLOWPATH FROM NODE 20300.00 TO NODE 20352.00 = 16236.90 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.49;6H= 2.20;24H= 4.63 S-GRAPH: VALLEY (DEV.) = 40.8%; VALLEY (UNDEV.) / DESERT= 59.2% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.58; Ybar = 0.65 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82; 3HR = 0.97; 6HR = 0.99; 24HR = 0.99UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3979.3 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20352.00 = 20097.32 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0447; Lca/L=0.4, n=.0400; Lca/L=0.5, n=.0368; Lca/L=0.6, n=.0343 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 575.28 PEAK FLOW RATE (CFS) = 1662.57\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20352.00 TO NODE 20352.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<<< \_\_\_\_\_ \* FLOW PROCESS FROM NODE 20352.00 TO NODE 20353.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<< \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1655.00 DOWNSTREAM(FEET) = 1625.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 1454.79 CHANNEL SLOPE = 0.0206 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00 CHANNEL FLOW THRU SUBAREA(CFS) = 1662.57 FLOW VELOCITY (FEET/SEC.) = 25.39 FLOW DEPTH (FEET) = 3.46 TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 46.14LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET. FLOW PROCESS FROM NODE 20353.00 TO NODE 20353.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>

Date: 04/21/2014 File name: LR0203ZZ.RES Page 41

Date: 04/21/2014

```
SUBAREA LOSS RATE DATA (AMC II):
MAINLINE Tc (MIN.) = 46.14
                                                                              DEVELOPMENT TYPE/
                                                                                                SCS SOIL AREA
                                                                                                                  Fρ
                                                                                                                           Αp
                                                                                                                                 SCS
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.937
                                                                                 LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             MOBILE HOME PARK
                                                                                                  В
                                                                                                         13.67
                                                                                                                   0.75
                                                                                                                          0.250
                                                                                                                                  56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
                                      Fρ
                                               Αp
                                                                             RESIDENTIAL
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                 В 19.97
                                                                                                                   0.75
                                                                                                                          0.600
                                                                                                                                  56
 SCHOOL
                       В
                              20.64
                                       0.75
                                              0.600
                                                     56
                                                                             RESIDENTIAL
                                                                             ".4 DWELLING/ACRE" B 5.87
 RESIDENTIAL
                                                                                                                   0.75 0.900
 "3-4 DWELLINGS/ACRE"
                            1.09
                                       0.75
                                              0.600
                                                     56
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.523
                       В
 ".4 DWELLING/ACRE"
                              25.75
                                       0.75
                                              0.900
                                                     56
                                                                             SUBAREA AREA (ACRES) = 39.51
 NATURAL FAIR COVER
                                                                             UNIT-HYDROGRAPH DATA:
 "OPEN BRUSH"
                       В
                            2.69
                                       0.61
                                            1.000
                                                                             RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.49;6H= 2.20;24H= 4.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
                                                                             S-GRAPH: VALLEY (DEV.) = 41.3%; VALLEY (UNDEV.) / DESERT = 58.7%
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.775
                                                                                     MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             Tc(HR) = 0.78; LAG(HR) = 0.63; Fm(INCH/HR) = 0.58; Ybar = 0.65
 SUBAREA AREA (ACRES) = 50.17
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.49;6H= 2.20;24H= 4.62
                                                                             DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 S-GRAPH: VALLEY(DEV.) = 40.8%; VALLEY(UNDEV.) / DESERT = 59.2%
                                                                             3HR = 0.97; 6HR = 0.99; 24HR = 0.99
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4069.0
 Tc(HR) = 0.77; LAG(HR) = 0.62; Fm(INCH/HR) = 0.58; Ybar = 0.65
                                                                             LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                              EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
                                                                              Lca/L=0.3,n=.0414; Lca/L=0.4,n=.0371; Lca/L=0.5,n=.0341; Lca/L=0.6,n=.0318
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
                                                                             TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 589.86
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4029.5
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1671.17
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20353.00 = 21552.11 FEET.
                                                                             TOTAL AREA(ACRES) = 4069.0
                                                                                                         PEAK FLOW RATE(CFS) = 1671.17
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0428; Lca/L=0.4,n=.0384; Lca/L=0.5,n=.0353; Lca/L=0.6,n=.0329
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 581.93
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1660.12
                                                                            ******************
 TOTAL AREA(ACRES) = 4029.5 PEAK FLOW RATE(CFS) = 1662.57
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                              FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1
                                                                            ______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                            ______
                                                                             TOTAL NUMBER OF STREAMS = 2
******************
                                                                             CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 FLOW PROCESS FROM NODE 20353.00 TO NODE 20376.00 IS CODE = 54
                                                                             PEAK FLOW RATE (CFS) = 1671.17 Tc (MIN.) = 47.08
______
                                                                             AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.65
                                                                             TOTAL AREA (ACRES) = 4069.0
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                            ****************
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1600.00
                                                                             FLOW PROCESS FROM NODE 20360.00 TO NODE 20361.00 IS CODE = 21
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1369.05 CHANNEL SLOPE = 0.0183
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
                                                                             >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
                                                                             >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 CHANNEL FLOW THRU SUBAREA(CFS) = 1662.57
                                                                            _____
 FLOW VELOCITY (FEET/SEC.) = 24.30 FLOW DEPTH (FEET) = 3.57
                                                                              INITIAL SUBAREA FLOW-LENGTH (FEET) = 985.35
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 2220.00 DOWNSTREAM(FEET) = 2160.00
 TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 47.08
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
                                                                             Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.078
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 81
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.093
                                                                             SUBAREA To AND LOSS RATE DATA (AMC II):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                  Fρ
                                                                                                                                 SCS Tc
                                                                                                                           αA
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
______
                                                                                 LAND USE
 MAINLINE Tc (MIN.) = 47.08
                                                                             RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.925
                                                                             "2 DWELLINGS/ACRE"
                                                                                                           6.63
                                                                                                                   0.75
                                                                                                                          0.700
                                                                                                                                56 12.08
```

Date: 04/21/2014 File name: LR0203ZZ.RES Page 43

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 44

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 9.36
 TOTAL AREA(ACRES) = 6.63 PEAK FLOW RATE(CFS) = 9.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
FLOW PROCESS FROM NODE 20361.00 TO NODE 20362.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2130.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.55 CHANNEL SLOPE = 0.0586
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                            9.36
 FLOW VELOCITY (FEET/SEC.) = 2.19 FLOW DEPTH (FEET) = 0.29
 TRAVEL TIME (MIN.) = 3.90 Tc (MIN.) = 15.98
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20362.00 = 1496.90 FEET.
*****************
 FLOW PROCESS FROM NODE 20362.00 TO NODE 20362.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
_____
 MAINLINE Tc(MIN.) = 15.98
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.769
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                  Fр
                                          Ар
                                                SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                           5.52
                                   0.75
                                          0.700
                                               56
                   В
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                                          0.600
                                                56
                     В
                           0.40
                                   0.75
 NATURAL FAIR COVER
 "OPEN BRUSH"
                           3.20
                                   0.61
                                          1.000
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                   В
                           3.04
                                   0.75
                                          0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
 SUBAREA AREA(ACRES) = 12.16
                           SUBAREA RUNOFF(CFS) = 14.01
 EFFECTIVE AREA(ACRES) = 18.79 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 18.8 PEAK FLOW RATE(CFS) =
                                                 21.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
FLOW PROCESS FROM NODE 20362.00 TO NODE 20363.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2130.00 DOWNSTREAM(FEET) = 2110.00
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 490.89 CHANNEL SLOPE = 0.0407
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 40.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                           21.45
 FLOW VELOCITY (FEET/SEC.) = 2.51 FLOW DEPTH (FEET) = 0.46
 TRAVEL TIME (MIN.) = 3.26 Tc (MIN.) = 19.24
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20363.00 = 1987.79 FEET.
******************
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20363.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 19.24
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.583
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           Αр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            2.09
                                    0.75
                                           0.600
                                                  56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 5.13
                                    0.75
                                           0.700
                                                  56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                            0.30
                                    0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 7.52
                           SUBAREA RUNOFF (CFS) = 7.28
 EFFECTIVE AREA(ACRES) = 26.31 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 26.3
                             PEAK FLOW RATE(CFS) =
                                                  25.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*******************
 FLOW PROCESS FROM NODE 20363.00 TO NODE 20364.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2110.00 DOWNSTREAM(FEET) = 2100.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 560.20 CHANNEL SLOPE = 0.0179
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 25.58
 FLOW VELOCITY (FEET/SEC.) = 1.83 FLOW DEPTH (FEET) = 0.53
 TRAVEL TIME (MIN.) = 5.11 Tc (MIN.) = 24.36
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20364.00 = 2547.99 FEET.
******************
 FLOW PROCESS FROM NODE 20364.00 TO NODE 20364.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 24.36
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.374
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp Ap
                                                 SCS
```

Date: 04/21/2014 File name: LR0203ZZ.RES

Page 46

```
LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B
                            10.47
                                     0.75
                                            0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         1.47
                                     0.75 0.600
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA(ACRES) = 11.94
                             SUBAREA RUNOFF (CFS) = 9.24
 EFFECTIVE AREA(ACRES) = 38.25 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) =
                     38.2
                              PEAK FLOW RATE (CFS) =
                                                    29.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
********************
 FLOW PROCESS FROM NODE 20364.00 TO NODE 20365.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2090.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 586.56 CHANNEL SLOPE = 0.0170
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             29.87
 FLOW VELOCITY (FEET/SEC.) = 1.86 FLOW DEPTH (FEET) = 0.57
 TRAVEL TIME (MIN.) = 5.27 Tc (MIN.) = 29.63
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20365.00 = 3134.55 FEET.
******************
 FLOW PROCESS FROM NODE 20365.00 TO NODE 20365.00 IS CODE = 81
-----
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 29.63
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.222
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fρ
                                             αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                           0.95
 "3-4 DWELLINGS/ACRE" B
                                     0.75
                                            0.600
                                                  56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 11.94
                                     0.75
                                            0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA (ACRES) = 12.89
                             SUBAREA RUNOFF (CFS) = 8.16
 EFFECTIVE AREA(ACRES) = 51.14 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 51.1 PEAK FLOW RATE (CFS) = 32.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
FLOW PROCESS FROM NODE 20365.00 TO NODE 20366.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

```
ELEVATION DATA: UPSTREAM(FEET) = 2090.00 DOWNSTREAM(FEET) = 2055.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 592.61 CHANNEL SLOPE = 0.0591
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             32.79
 FLOW VELOCITY (FEET/SEC.) = 3.07 FLOW DEPTH (FEET) = 0.46
 TRAVEL TIME (MIN.) = 3.22 Tc (MIN.) = 32.85
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20366.00 = 3727.16 FEET.
*******************
 FLOW PROCESS FROM NODE 20366.00 TO NODE 20366.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 32.85
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.148
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                 ďΨ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.40
                                    0.75 0.600
                                                  56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    в 7.97
                                    0.75 0.700
                                                  56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA AREA (ACRES) = 8.37
                           SUBAREA RUNOFF (CFS) = 4.73
 EFFECTIVE AREA(ACRES) = 59.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 59.5 PEAK FLOW RATE (CFS) =
                                                34.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*******************
 FLOW PROCESS FROM NODE 20366.00 TO NODE 20367.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2055.00 DOWNSTREAM(FEET) = 2040.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 831.01 CHANNEL SLOPE = 0.0181
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             34.15
 FLOW VELOCITY (FEET/SEC.) = 1.96 FLOW DEPTH (FEET) = 0.59
 TRAVEL TIME (MIN.) = 7.07 Tc (MIN.) = 39.92
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20367.00 = 4558.17 FEET.
*******************
 FLOW PROCESS FROM NODE 20367.00 TO NODE 20367.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 39.92
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.022
 SUBAREA LOSS RATE DATA (AMC II):
```

File name: LR020377.RFS

Page 48

Date: 04/21/2014

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <

```
DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                                                 SCS
                                           Αр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        40.07
                                    0.75
                                           0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.44 0.75 0.600
                                                56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 44.51 SUBAREA RUNOFF (CFS) = 20.25
 EFFECTIVE AREA(ACRES) = 104.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 104.0 PEAK FLOW RATE (CFS) = 47.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20367.00 TO NODE 20368.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2040.00 DOWNSTREAM(FEET) = 1970.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 949.68 CHANNEL SLOPE = 0.0737
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             47.61
 FLOW VELOCITY (FEET/SEC.) = 3.60 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 4.39 Tc (MIN.) = 44.31
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20368.00 = 5507.85 FEET.
FLOW PROCESS FROM NODE 20368.00 TO NODE 20368.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 44.31
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.960
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           Αp
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                 56
 "2 DWELLINGS/ACRE"
                    В 15.48
                                 0.75
                                           0.700
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.21
                                   0.75
                                           0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.703
 SUBAREA AREA(ACRES) = 15.69
                         SUBAREA RUNOFF (CFS) = 6.13
 EFFECTIVE AREA(ACRES) = 119.71 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 119.7
                           PEAK FLOW RATE(CFS) =
                                                  47.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
******************
 FLOW PROCESS FROM NODE 20368.00 TO NODE 20369.00 IS CODE = 54
._____
```

```
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1900.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 892.15 CHANNEL SLOPE = 0.0785
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             47.93
 FLOW VELOCITY (FEET/SEC.) = 3.71 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 4.01 Tc (MIN.) = 48.32
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20369.00 = 6400.00 FEET.
**********************
 FLOW PROCESS FROM NODE 20369.00 TO NODE 20369.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 48.32
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.911
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                SCS
                                          Дp
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 29.59
                                   0.75 0.700
                                                 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   B 0.11 0.75 0.900
                                                 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.701
                         SUBAREA RUNOFF(CFS) = 10.34
 SUBAREA AREA(ACRES) = 29.70
 EFFECTIVE AREA(ACRES) = 149.41 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 149.4
                            PEAK FLOW RATE(CFS) =
                                                 53.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
*****
 FLOW PROCESS FROM NODE 20369.00 TO NODE 20370.00 IS CODE = 54
_______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1900.00 DOWNSTREAM(FEET) = 1860.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 949.40 CHANNEL SLOPE = 0.0421
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 53.04
 FLOW VELOCITY (FEET/SEC.) = 3.02 FLOW DEPTH (FEET) = 0.59
 TRAVEL TIME (MIN.) = 5.23 Tc (MIN.) = 53.55
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20370.00 = 7349.40 FEET.
FLOW PROCESS FROM NODE 20370.00 TO NODE 20370.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_______
 MAINLINE Tc(MIN.) = 53.55
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.857
```

File name: LR0203ZZ.RES

Page 50

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

Date: 04/21/2014

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
                                       Fρ
                                                 Дp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA (ACRES) = 5.65 SUBAREA RUNOFF (CFS) = 1.62
                                                                                EFFECTIVE AREA(ACRES) = 172.49 AREA-AVERAGED Fm(INCH/HR) = 0.53
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      в 9.75
                                        0.75
                                                0.900
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
 RESIDENTIAL
                                                                                TOTAL AREA (ACRES) = 172.5 PEAK FLOW RATE (CFS) =
 "3-4 DWELLINGS/ACRE" B 0.37
                                        0.75
                                                0.600
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                       56
 RESIDENTIAL
                                        0.75 0.700 56
 "2 DWELLINGS/ACRE"
                      в 7.31
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.810
 SUBAREA AREA(ACRES) = 17.43
                            SUBAREA RUNOFF(CFS) = 3.93
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 166.84 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                                DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.65
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.71
                                                                                FLOW VELOCITY (FEET/SEC.) = 4.82 DEPTH*VELOCITY (FT*FT/SEC.) = 2.86
 TOTAL AREA (ACRES) = 166.8
                               PEAK FLOW RATE (CFS) = 53.04
                                                                                LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20371.00 = 8120.76 FEET.
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 20371.00 TO NODE 20372.00 IS CODE = 63
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                .....
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               _____
 FLOW PROCESS FROM NODE 20370.00 TO NODE 20371.00 IS CODE = 63
______
                                                                                UPSTREAM ELEVATION(FEET) = 1845.00 DOWNSTREAM ELEVATION(FEET) = 1825.00
                                                                                STREET LENGTH (FEET) = 580.50 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1860.00 DOWNSTREAM ELEVATION(FEET) = 1845.00
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 771.36 CURB HEIGHT (INCHES) = 6.0
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 53.85
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 21.06
   ***STREET FLOWING FULL***
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.07
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.41
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 57.79
   HALFSTREET FLOOD WIDTH (FEET) = 22.77
                                                                                * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.818
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.85
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.89
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
 STREET FLOW TRAVEL TIME (MIN.) = 2.65 Tc (MIN.) = 56.20
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   LAND USE
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.832
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 3.05
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                       0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE" B 36.06 0.75 0.700
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 "3-4 DWELLINGS/ACRE" B
                             1.23
                                        0.75
                                                0.600
                                                      56
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 RESIDENTIAL
                                                                                SUBAREA AREA (ACRES) = 39.11 SUBAREA RUNOFF (CFS) = 10.58
 ".4 DWELLING/ACRE"
                               0.24
                                        0.75
                                                0.900
                                                       56
                                                                                EFFECTIVE AREA(ACRES) = 211.60 AREA-AVERAGED Fm(INCH/HR) = 0.52
 RESIDENTIAL
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 "2 DWELLINGS/ACRE"
                               4.18
                                        0.75
                                                0.700
                                                                                TOTAL AREA (ACRES) = 211.6 PEAK FLOW RATE (CFS) = 56.02
```

Page 51

Date: 04/21/2014

File name: LR0203ZZ.RES

Date: 04/21/2014 File name: LR0203ZZ.RES Page 52

53.04

58.33

αA

0.600

56

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                   DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.04
                                                                                   FLOW VELOCITY (FEET/SEC.) = 6.23 DEPTH*VELOCITY (FT*FT/SEC.) = 3.73
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.76
                                                                                       AND L = 1298.8 FT WITH ELEVATION-DROP = 55.0 FT, IS 107.7 CFS,
 FLOW VELOCITY (FEET/SEC.) = 5.99 DEPTH*VELOCITY (FT*FT/SEC.) = 3.33
                                                                                         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20373.00
                                                                                   LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20373.00 = 10000.04 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 580.5 FT WITH ELEVATION-DROP = 20.0 FT, IS 62.8 CFS,
                                                                                  ************************
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20372.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20372.00 = 8701.26 FEET.
                                                                                   FLOW PROCESS FROM NODE 20373.00 TO NODE 20374.00 IS CODE = 63
*****
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20372.00 TO NODE 20373.00 IS CODE = 63
                                                                                   >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  ______
                                                                                    UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1720.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                   STREET LENGTH (FEET) = 1333.48 CURB HEIGHT (INCHES) = 8.0
_____
                                                                                   STREET HALFWIDTH (FEET) = 26.00
 UPSTREAM ELEVATION(FEET) = 1825.00 DOWNSTREAM ELEVATION(FEET) = 1770.00
 STREET LENGTH (FEET) = 1298.78 CURB HEIGHT (INCHES) = 8.0
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET HALFWIDTH (FEET) = 26.00
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.79
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                       66.87
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
                                                                                     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     STREET FLOW DEPTH (FEET) = 0.62
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    62.19
                                                                                     HALFSTREET FLOOD WIDTH (FEET) = 23.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.05
   STREET FLOW DEPTH (FEET) = 0.60
                                                                                     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75
   HALFSTREET FLOOD WIDTH (FEET) = 21.93
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 3.67 Tc (MIN.) = 64.94
                                                                                   * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.763
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.71
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 3.48 Tc (MIN.) = 61.27
                                                                                    DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.790
                                                                                        LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                   RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                   "3-4 DWELLINGS/ACRE" B 6.64 0.75 0.600
                                                                                                                                            56
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                   RESIDENTIAL
                                                                                   ".4 DWELLING/ACRE" B 73.46 0.75 0.900
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.56
                                          0.75
                                                  0.600 56
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.875
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      В 75.29
                                          0.75
                                                  0.900
                                                                                   SUBAREA AREA(ACRES) = 80.10 SUBAREA RUNOFF(CFS) = 7.81
                                                                                   EFFECTIVE AREA(ACRES) = 383.46 AREA-AVERAGED Fm(INCH/HR) = 0.58
 RESIDENTIAL
                      В 9.91
 "2 DWELLINGS/ACRE"
                                         0.75 0.700 56
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.78
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   TOTAL AREA (ACRES) = 383.5 PEAK FLOW RATE (CFS) = 63.35
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
 SUBAREA AREA (ACRES) = 91.76 SUBAREA RUNOFF (CFS) = 12.31
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 303.36 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                                   5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 303.4 PEAK FLOW RATE (CFS) = 62.95
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                   DEPTH (FEET) = 0.61 HALFSTREET FLOOD WIDTH (FEET) = 22.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   FLOW VELOCITY (FEET/SEC.) = 5.96 DEPTH*VELOCITY (FT*FT/SEC.) = 3.64
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
                                                                                    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
```

Date: 04/21/2014

File name: LR0203ZZ.RES

Page 53 Date: 04/21/2014 File name: LR0203ZZ.RES Page 54

```
AND L = 1333.5 FT WITH ELEVATION-DROP = 50.0 FT, IS 90.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20374.00
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20374.00 = 11333.52 FEET.
******************
 FLOW PROCESS FROM NODE 20374.00 TO NODE 20375.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1660.00
 STREET LENGTH (FEET) = 1282.17 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.75
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.58
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.95
 STREET FLOW TRAVEL TIME (MIN.) = 3.25 Tc (MIN.) = 68.19
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.741
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                                          Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.27
                                       0.75 0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 70.54
                                       0.75
                                                  0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.869
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) = 78.81
                                SUBAREA RUNOFF(CFS) = 6.91
 EFFECTIVE AREA(ACRES) = 462.27 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.79
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA (ACRES) = 462.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 21.75
 FLOW VELOCITY (FEET/SEC.) = 6.52 DEPTH*VELOCITY (FT*FT/SEC.) = 3.87
```

LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20375.00 = 12615.69 FEET.

File name: LR020377.RFS

Page 55

Date: 04/21/2014

```
FLOW PROCESS FROM NODE 20375.00 TO NODE 20376.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1660.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1887.14 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 15.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.61
 PIPE-FLOW(CFS) =
                     64.15
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.01 Tc (MIN.) = 70.20
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.728
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.76
                                          0.75
                                                  0.600
                                                           56
 RESIDENTIAL
                       в 79.51
                                          0.75 0.900
 ".4 DWELLING/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA (ACRES) = 97.27 SUBAREA RUNOFF (CFS) = 9.87
 EFFECTIVE AREA(ACRES) = 559.54 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.80
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 TOTAL AREA (ACRES) = 559.5 PEAK FLOW RATE (CFS) = 72.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                             STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 8.76
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.36
   HALFSTREET FLOOD WIDTH (FEET) = 10.26
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 LONGEST FLOWPATH FROM NODE 20360.00 TO NODE 20376.00 = 14502.83 FEET.
```

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 70.20
 RAINFALL INTENSITY (INCH/HR) = 0.73
 AREA-AVERAGED Fm(INCH/HR) = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.80
 EFFECTIVE STREAM AREA(ACRES) = 559.54
 TOTAL STREAM AREA(ACRES) = 559.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                              72.91
 ** CONFLUENCE DATA **
               Tc
                      AREA
                              HEADWATER
 STREAM
        Q
 NUMBER (CFS) (MIN.) (ACRES)
                               NODE
   1
        1671.17 47.08 4068.99 20120.00
   2
         72.91 70.20
                      559.54 20360.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.48;6H= 2.18;24H= 4.60
 S-GRAPH: VALLEY (DEV.) = 41.6%; VALLEY (UNDEV.) / DESERT = 58.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.78; LAG(HR) = 0.63; Fm(INCH/HR) = 0.58; Ybar = 0.65
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0414; Lca/L=0.4,n=.0371; Lca/L=0.5,n=.0341; Lca/L=0.6,n=.0318
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) =
 PEAK FLOW RATE(CFS) = 1828.74
FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES)
               =
                      4628.5 TC(MIN.) =
                                       47.08
 AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.65
 PEAK FLOW RATE (CFS) = 1828.74
_____
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 1

Date: 04/21/2014 File name: LR0203ZZ.RES Page 57 Date: 04/21/2014 File name: LR0203ZZ.RES Page 58

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* REDLANDS MPD - UPDATE

KEDUANDS HID GIDAIE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20454

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*

FILE NAME: LR0204ZZ.DAT

TIME/DATE OF STUDY: 09:44 04/02/2014

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGI AND HIDRAULIC MODEL INFORMATION.

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====			=====	=====		=====	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

18	20.0 26.0 52.0	15.0	0.020/0.02	20/0.020	0.67	2.00	0.0312 0	.167	0.0180
2 *S1 OF	DBAL STREE . Relativ as (Max 2. (Depth) ZZE PIPE W R EQUAL TO SER-SPECIF	e Flow-De imum Allo *(Velocit ITH A FLO THE UPST	oth = 0.2 wable Stre y) Constra W CAPACITY REAM TRIBU	20 FEET eet Flow aint = 6 Y GREATER JTARY PIP	.0 (FT*FT THAN E.*	r/s)		TED	
V 1 1 1 1 1 1 1	T-HYDROGR WATERSHED JSED "VALL UNITS/AC FOR DEVELO PRECIPITAT BIERRA MAD RECEDENT M	LAG = 0.8 EY UNDEVE RE AND LE PMENTS OF ION DATA RE DEPTH-	0 * Tc LOPED" S-C SS; AND "V 2 UNITS/ <i>H</i> ENTERED ON AREA FACTO	GRAPH FOR VALLEY DE ACRE AND N SUBAREA ORS USED.	DEVELOPN VELOPED" MORE. BASIS.	S-GRAF	PH	RAPH 1	METHOD*
	********* OW PROCESS								*****
J<<	>>>RATIONA JSE TIME-O	F-CONCENT	RATION NON	MOGRAPH F	OR INITIA	AL SUBA	AREA<<		
TC SUE *	TIAL SUBA EVATION DA  = K*[(LEN BAREA ANAL 10 YEAR R BAREA TC A	TA: UPSTR GTH** 3.0 YSIS USED AINFALL II ND LOSS R	EAM(FEET)  O)/(ELEVAT MINIMUM T NTENSITY(1 ATE DATA(	= 1720 TION CHAN TC(MIN.) ENCH/HR)	.00 DOWN GE)]**0.2 = 11.33 = 2.174	20 38			
	EVELOPMENT LAND US SIDENTIAL		SCS SOI GROUP	IL AREA (ACRES	Fp (INCH)	/HR) (	Ap (DECIMAL)	SCS	Tc (MIN.)
".4	DWELLING	/ACRE"					0.900	56	
		,	_						
"3- SUE SUE SUE	-4 DWELLIN BAREA AVER BAREA AVER BAREA RUNO TAL AREA(A	AGE PERVI AGE PERVI FF(CFS) =	OUS LOSS F OUS AREA F 16.14	RATE, Fp( FRACTION,	INCH/HR) $Ap = 0$	= 0.7			11.34
"3- SUE SUE TOT	BAREA AVER BAREA AVER BAREA RUNO	AGE PERVI AGE PERVI FF(CFS) = CRES) = -AVERAGED	DUS LOSS F DUS AREA F 16.14 10.41 RAINFALL	RATE, Fp( FRACTION, ! PEAK FL DEPTH(IN	INCH/HR) Ap = 0  OW RATE(C	= 0.7 .604 CFS) =	16.1	4	
"3- SUE SUE SUE TOT SUE 5M	BAREA AVER BAREA AVER BAREA RUNO TAL AREA(A BAREA AREA	AGE PERVIOUS AGE PERVIOUS FF (CFS) = CRES) = -AVERAGED OM = 0.61	OUS LOSS F OUS AREA F 16.14 10.41  RAINFALL; 1HR = 0.	RATE, Fp( FRACTION, PEAK FL DEPTH(IN 80; 3HR	INCH/HR) Ap = 0.  OW RATE(( CH): = 1.37; ( ************************************	= 0.7 .604 CFS) = 5HR = 1	16.1 92; 24H	4 R = 3 ****	.88
"3- SUE SUE SUE TOT SUE 5M **** FLC >>>	BAREA AVER BAREA AVER BAREA RUNO TAL AREA (A BAREA AREA = 0.30; 3 *********** DW PROCESS>>COMPUTE >>> (STREET	AGE PERVIONAGE PERVION	DUS LOSS F  DUS AREA F  16.14  10.41  RAINFALL  ; 1HR = 0.  **********  E 20401.0  LOW TRAVEL  COTION # 5	RATE, Fp( FRACTION, PEAK FL DEPTH(IN 80; 3HR TO NOD TO NOD TIME TH	INCH/HR) Ap = 0  OW RATE((  CH): = 1.37; (  ******** E 20402 RU SUBARE	= 0.7.604  CFS) =  6HR = 1  **********************************	16.192; 24H	4  R = 3  ***** 63	.88 ******
"3- SUE SUE TOT  SUE 5M  **** FLC >>> UPS STE	BAREA AVER BAREA RUNO CAL AREA(A BAREA AREA = 0.30; 3  ********** W PROCESS >>>COMPUTE	AGE PERVI AGE PERVI FF(CFS) = CRES) =  -AVERAGED OM = 0.61  *******  FROM NOD: STREET F TABLE SE ===================================	DUS LOSS F  16.14  10.41  RAINFALL ; 1HR = 0.  ********* E 20401.0  LOW TRAVEI CTION # 5  ET) = 1670  293.15	RATE, FP(FRACTION, PEAK FL DEPTH(IN 80; 3HR ******** TIME TH USED)<<	INCH/HR) Ap = 0  OW RATE (C  CH): = 1.37; (C  ********  E 20402  RU SUBARR  <<< =======  NSTREAM I	= 0.7.604  CFS) =   5HR = 1  ******  .00 IS  ======  ELEVATI	16.192; 24H	4  R = 3  ***** 63	.88 *****

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 14.68
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.06
 STREET FLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 12.33
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.067
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                qД
                                                         SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      B 0.06 0.75 0.900 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.48 0.75
                                                 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.602
 SUBAREA AREA(ACRES) = 8.54 SUBAREA RUNOFF(CFS) = 12.43
 EFFECTIVE AREA(ACRES) = 18.95 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 19.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.93
 FLOW VELOCITY (FEET/SEC.) = 5.19 DEPTH*VELOCITY (FT*FT/SEC.) = 2.31
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20402.00 = 1217.22 FEET.
******************
 FLOW PROCESS FROM NODE 20402.00 TO NODE 20403.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1657.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 198.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 29.45
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.58
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.20
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.77
 STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 13.36
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.970
 SUBAREA LOSS RATE DATA (AMC II):
                                      Fр
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.76 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 2.76 SUBAREA RUNOFF (CFS) = 3.78
 EFFECTIVE AREA(ACRES) = 21.71 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 21.7 PEAK FLOW RATE(CFS) =
                                                           29.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.64
 FLOW VELOCITY (FEET/SEC.) = 3.21 DEPTH*VELOCITY (FT*FT/SEC.) = 1.77
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20403.00 = 1415.72 FEET.
******************
 FLOW PROCESS FROM NODE 20403.00 TO NODE 20404.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1645.00
 STREET LENGTH (FEET) = 470.13 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     34.91
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 19.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.32
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 4

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
 STREET FLOW TRAVEL TIME (MIN.) = 1.81 Tc (MIN.) = 15.18
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.825
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                               Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.38
                                        0.75
                                                0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.08 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 8.46 SUBAREA RUNOFF (CFS) = 10.46
 EFFECTIVE AREA(ACRES) = 30.17 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 30.2 PEAK FLOW RATE (CFS) = 37.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.60
 FLOW VELOCITY (FEET/SEC.) = 4.43 DEPTH*VELOCITY (FT*FT/SEC.) = 2.36
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20404.00 = 1885.85 FEET.
*************************
 FLOW PROCESS FROM NODE 20404.00 TO NODE 20405.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1645.00 DOWNSTREAM ELEVATION(FEET) = 1635.00
 STREET LENGTH (FEET) = 344.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.07
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.15
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.73
 STREET FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 16.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.749
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"3-4 DWELLINGS/ACRE" B 9.77 0.75 0.600
                                                          56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 0.09 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 9.86 SUBAREA RUNOFF (CFS) = 11.52
 EFFECTIVE AREA(ACRES) = 40.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 40.0 PEAK FLOW RATE(CFS) = 46.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 FLOW VELOCITY (FEET/SEC.) = 5.31 DEPTH*VELOCITY (FT*FT/SEC.) = 2.88
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20405.00 = 2230.11 FEET.
******************
 FLOW PROCESS FROM NODE 20405.00 TO NODE 20406.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
>>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1635.00 DOWNSTREAM ELEVATION(FEET) = 1620.00
 STREET LENGTH (FEET) = 701.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     57.19
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.03
 STREET FLOW TRAVEL TIME (MIN.) = 2.48 Tc (MIN.) = 18.78
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.606
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 20.00
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 20.00 SUBAREA RUNOFF (CFS) = 20.83
 EFFECTIVE AREA(ACRES) = 60.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 60.0 PEAK FLOW RATE (CFS) = 62.45
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 6

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.09
 FLOW VELOCITY (FEET/SEC.) = 4.81 DEPTH*VELOCITY (FT*FT/SEC.) = 3.18
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20406.00 = 2931.13 FEET.
********************
 FLOW PROCESS FROM NODE 20406.00 TO NODE 20407.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1620.00 DOWNSTREAM ELEVATION(FEET) = 1612.00
 STREET LENGTH (FEET) = 570.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.02
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.89
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.98
 STREET FLOW TRAVEL TIME (MIN.) = 2.24 Tc (MIN.) = 21.02
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.501
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.31 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.31 SUBAREA RUNOFF (CFS) = 5.03
 EFFECTIVE AREA(ACRES) = 65.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 65.3 PEAK FLOW RATE (CFS) = 62.45
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.58
 FLOW VELOCITY (FEET/SEC.) = 4.16 DEPTH*VELOCITY (FT*FT/SEC.) = 2.91
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20407.00 = 3501.13 FEET.
```

```
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1612.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 804.76 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.32
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 25.33
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.48
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.64
 STREET FLOW TRAVEL TIME (MIN.) = 2.45 Tc (MIN.) = 23.47
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.405
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                             αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 22.89 0.75 0.600
 COMMERCIAL
                     В
                            0.02 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 22.91 SUBAREA RUNOFF (CFS) = 19.72
 EFFECTIVE AREA(ACRES) = 88.25 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 88.2 PEAK FLOW RATE (CFS) = 75.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.17
 FLOW VELOCITY (FEET/SEC.) = 5.54 DEPTH*VELOCITY (FT*FT/SEC.) = 3.74
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20408.00 = 4305.89 FEET.
******************
 FLOW PROCESS FROM NODE 20408.00 TO NODE 20409.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH(FEET) = 498.42 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
```

File name: LR020477.RFS

Page 8

Date: 04/21/2014

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20407.00 TO NODE 20408.00 IS CODE = 63

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 139.13
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.78
                                                                                  ***STREET FLOWING FULL***
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  STREET FLOW DEPTH (FEET) = 0.79
   ***STREET FLOWING FULL***
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 32.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.77
   STREET FLOW DEPTH (FEET) = 0.69
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.36
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 3.38 Tc (MIN.) = 28.06
   HALFSTREET FLOOD WIDTH (FEET) = 27.10
                                                                                * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.262
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.88
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.74
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 24.68
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.363
                                                                                     LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                NATURAL FAIR COVER
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                "OPEN BRUSH"
                                                                                                     B 0.01 0.61 1.000
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 52.45 0.75 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 51.42
                                     0.75
                                                0.600 56
                                                                                PUBLIC PARK
                                                                                                     B 0.03 0.75 0.850 56
                      B 4.09
                                        0.75
                                                0.100 56
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 COMMERCIAL
 RESIDENTIAL
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 ".4 DWELLING/ACRE" B 0.43 0.75 0.900 56
                                                                                SUBAREA AREA (ACRES) = 52.49 SUBAREA RUNOFF (CFS) = 38.42
                                                                                EFFECTIVE AREA(ACRES) = 196.68 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.566
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                                TOTAL AREA (ACRES) = 196.7 PEAK FLOW RATE (CFS) = 145.19
 SUBAREA AREA(ACRES) = 55.94 SUBAREA RUNOFF(CFS) = 47.33
 EFFECTIVE AREA(ACRES) = 144.19 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 144.2 PEAK FLOW RATE (CFS) = 119.90
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                                DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.65
                                                                                FLOW VELOCITY (FEET/SEC.) = 6.88 DEPTH*VELOCITY (FT*FT/SEC.) = 5.50
                                                                                LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.68
                                                                               *******************
 FLOW VELOCITY (FEET/SEC.) = 7.39 DEPTH*VELOCITY (FT*FT/SEC.) = 5.32
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 10
       AND L = 498.4 FT WITH ELEVATION-DROP = 20.0 FT, IS 125.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20409.00
                                                                                >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20409.00 = 4804.31 FEET.
                                                                               ______
*****************
                                                                               ******************
                                                                                FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 15.1
 FLOW PROCESS FROM NODE 20409.00 TO NODE 20410.00 IS CODE = 63
                                                                                >>>>DEFINE MEMORY BANK # 2 <<<<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                               _____
_____
                                                                                PEAK FLOWRATE TABLE FILE NAME: 20376.DNA
 UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1533.00
                                                                                MEMORY BANK # 2 DEFINED AS FOLLOWS:
 STREET LENGTH (FEET) = 1374.92 CURB HEIGHT (INCHES) = 8.0
                                                                                PEAK FLOW RATE (CFS) = 1828.74 Tc (MIN.) = 47.08
 STREET HALFWIDTH (FEET) = 26.00
                                                                                AREA-AVERAGED Fm (INCH/HR) = 0.58 Ybar = 0.65
                                                                                TOTAL AREA (ACRES) = 4628.5
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SCS

66

56

Date: 04/21/2014 File name: LR0204ZZ.RES Date: 04/21/2014 Page 9 File name: LR020477.RFS Page 10

```
******************
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1828.74 Tc (MIN.) = 47.08
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.65
 TOTAL AREA (ACRES) = 4628.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20376.00 = 22921.16 FEET.
*****
 FLOW PROCESS FROM NODE 20376.00 TO NODE 20376.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<<
______
FLOW PROCESS FROM NODE 20376.00 TO NODE 20410.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1533.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2846.26 CHANNEL SLOPE = 0.0235
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 1828.74
 FLOW VELOCITY (FEET/SEC.) = 27.35 FLOW DEPTH (FEET) = 3.51
 TRAVEL TIME (MIN.) = 1.73 Tc (MIN.) = 48.81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 48.81
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.905
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                        Ap SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                           25.52
                                          0.600 56
 "3-4 DWELLINGS/ACRE"
                  В
                                   0.75
                                          0.850
                                               56
 PUBLIC PARK
                    В
                          5.30
                                  0.75
 SCHOOL
                           8.19
                                   0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA (ACRES) = 39.01
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.48;6H= 2.18;24H= 4.59
 S-GRAPH: VALLEY (DEV.) = 42.1%; VALLEY (UNDEV.) / DESERT= 57.9%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.81; LAG(HR) = 0.65; Fm(INCH/HR) = 0.58; Ybar = 0.65
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
```

```
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0387; Lca/L=0.4,n=.0347; Lca/L=0.5,n=.0319; Lca/L=0.6,n=.0297
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 663.95
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1799.68
                              PEAK FLOW RATE(CFS) = 1828.74
 TOTAL AREA (ACRES) = 4667.5
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
*************************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1828.74 Tc (MIN.) = 48.81
 AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.65
 TOTAL AREA (ACRES) = 4667.5
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
           Q Tc Intensity Fp(Fm)
                                        Ар Ае
                                                      HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          145.19 28.06 1.262 0.75(0.44) 0.59 196.7 20400.00
 LONGEST FLOWPATH FROM NODE 20400.00 TO NODE 20410.00 = 6179.23 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.48;6H= 2.17;24H= 4.56
 S-GRAPH: VALLEY (DEV.) = 44.4%; VALLEY (UNDEV.) / DESERT= 55.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.81; LAG(HR) = 0.65; Fm(INCH/HR) = 0.58; Ybar = 0.64
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.79; 30M = 0.79; 1HR = 0.79;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4864.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20410.00 = 25767.42 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0387; Lca/L=0.4,n=.0347; Lca/L=0.5,n=.0319; Lca/L=0.6,n=.0297
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 694.47
 PEAK FLOW RATE (CFS) = 1877.19
******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20410.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
_____
*******************
 FLOW PROCESS FROM NODE 20410.00 TO NODE 20452.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

Date: 04/21/2014 File name: LR0204ZZ.RES

Page 12

```
ELEVATION DATA: UPSTREAM(FEET) = 1533.00 DOWNSTREAM(FEET) = 1510.00
                                                                               >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1329.02 CHANNEL SLOPE = 0.0173
                                                                               >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
                                                                             MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
                                                                               INITIAL SUBAREA FLOW-LENGTH (FEET) = 575.26
 CHANNEL FLOW THRU SUBAREA(CFS) = 1877.19
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1735.00
 FLOW VELOCITY (FEET/SEC.) = 24.63 FLOW DEPTH (FEET) = 3.86
                                                                               Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 49.71
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
                                                                               SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.027
                                                                               * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.211
*****************
                                                                               SUBAREA To AND LOSS RATE DATA (AMC II):
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fр
                                                                                                                              Aр
                                                                                   LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                               RESIDENTIAL
______
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                             0.69
                                                                                                                     0.98
                                                                                                                             0.600
 MAINLINE Tc(MIN.) = 49.71
                                                                               MOBILE HOME PARK
                                                                                                    A
                                                                                                             4.22
                                                                                                                     0.98 0.250
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.896
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.299
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
                                               Аp
                                                      SCS
                                                                               SUBAREA RUNOFF(CFS) =
                                                                                                   8.48
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               TOTAL AREA (ACRES) = 4.91 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                              25.77
                                       0.75
                                               0.600
                                                      56
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PUBLIC PARK
                      В
                             1.54
                                       0.75
                                               0.850
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 NATURAL FAIR COVER
                                                                             *************************
                               0.79
 "OPEN BRUSH"
                        В
                                       0.61
                                               1.000
                                                      66
 COMMERCIAL
                               0.05
                                       0.75
                                               0.100
                                                                               FLOW PROCESS FROM NODE 20421.00 TO NODE 20422.00 IS CODE = 92
                                               0.250 56
 MOBILE HOME PARK
                       В
                               5.02
                                       0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
                                                                               >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.567
                                                                             _____
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1735.00
 SUBAREA AREA (ACRES) = 33.17
 UNIT-HYDROGRAPH DATA:
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1725.00
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 643.67
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.48;6H= 2.17;24H= 4.56
 S-GRAPH: VALLEY(DEV.) = 44.8%; VALLEY(UNDEV.) / DESERT = 55.2%
                                                                               "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                               PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 Tc(HR) = 0.83; LAG(HR) = 0.66; Fm(INCH/HR) = 0.58; Ybar = 0.64
                                                                               PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                               MAXIMUM DEPTH(FEET) = 1.00
 DEPTH-AREA FACTORS: 5M = 0.79; 30M = 0.79; 1HR = 0.79;
                                                                               * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.945
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4897.4
                                                                                DEVELOPMENT TYPE/
                                                                                                SCS SOIL AREA
                                                                                                                     Fρ
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                             2.50
                                                                                                                      0.98
                                                                                                                             0.250
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                               MOBILE HOME PARK
                                                                                                   A
  Lca/L=0.3, n=.0377; Lca/L=0.4, n=.0338; Lca/L=0.5, n=.0310; Lca/L=0.6, n=.0289
                                                                               RESIDENTIAL
                                                                                                  A 0.99
                                                                                                                     0.98
                                                                                                                             0.600
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 699.86
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                             2.87
                                                                                                                      0.98
                                                                                                                             0.100
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1856.44
                                                                               COMMERCIAL
                                                                                                     A
 TOTAL AREA (ACRES) = 4897.4
                              PEAK FLOW RATE (CFS) = 1877.19
                                                                               COMMERCIAL
                                                                                                             1.82
                                                                                                                      0.75
                                                                                                                             0.100
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                               RESIDENTIAL
                                                                                                             2.05
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                   В
                                                                                                                      0.75
                                                                                                                             0.600
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.285
                                                                               TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.28
******************
                                                                               TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.10
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 10
                                                                               AVERAGE FLOW DEPTH(FEET) = 0.56 FLOOD WIDTH(FEET) = 28.02
._____
                                                                               "V" GUTTER FLOW TRAVEL TIME (MIN.) = 2.62 Tc (MIN.) = 13.65
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                               SUBAREA AREA(ACRES) = 10.23 SUBAREA RUNOFF(CFS) = 15.64
                                                                               EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.26
______
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.90 AREA-AVERAGED Ap = 0.29
*****************
                                                                               TOTAL AREA (ACRES) = 15.1
                                                                                                             PEAK FLOW RATE(CFS) =
 FLOW PROCESS FROM NODE 20420.00 TO NODE 20421.00 IS CODE = 21
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

SCS Tc

SCS

32

32

32 13.52

32 11.03

Date: 04/21/2014 File name: LR0204ZZ.RES Date: 04/21/2014 File name: LR0204ZZ.RES Page 13 Page 14

FLOW PROCESS FROM NODE 20423.00 TO NODE 20424.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 13 USED) <<<< UPSTREAM ELEVATION (FEET) = 1712.00 DOWNSTREAM ELEVATION (FEET) = 1703.00 STREET LENGTH (FEET) = 258.55 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 32.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 36.96 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.53HALFSTREET FLOOD WIDTH (FEET) = 18.52 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 2.70STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 15.45\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.805 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN A 0.47 MOBILE HOME PARK 0.98 0.250 32 MOBILE HOME PARK В 0.58 0.75 0.250 56 В 2.83 0.75 0.100 56 COMMERCIAL COMMERCIAL 0.03 0.98 0.100 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.39 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.261 SUBAREA AREA (ACRES) = 5.30 SUBAREA RUNOFF (CFS) = 7.66 EFFECTIVE AREA (ACRES) = 28.06 AREA-AVERAGED Fm (INCH/HR) = 0.24 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.28 TOTAL AREA (ACRES) = 28.1 PEAK FLOW RATE (CFS) = 39.52 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.07 FLOW VELOCITY (FEET/SEC.) = 5.17 DEPTH\*VELOCITY (FT\*FT/SEC.) = 2.79 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20424.00 = 1776.65 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20424.00 TO NODE 20425.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

\*

>>>> (STREET TABLE SECTION # 13 USED) <<<<

LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20423.00 = 1518.10 FEET.

```
SUBAREA LOSS RATE DATA (AMC II):
_____
 UPSTREAM ELEVATION(FEET) = 1703.00 DOWNSTREAM ELEVATION(FEET) = 1696.00
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
                                                                                                                                   Αp
                                                                                                                                         SCS
 STREET LENGTH(FEET) = 197.56 CURB HEIGHT(INCHES) = 8.0
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET HALFWIDTH (FEET) = 32.00
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                                 1.17
                                                                                                                          0.75
                                                                                                                                  0.600
                                                                                  MOBILE HOME PARK
                                                                                                         В
                                                                                                                 0.01
                                                                                                                                  0.250
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                                                                          0.75
                                                                                                                                          56
                                                                                                                 0.54
                                                                                                                                          56
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  COMMERCIAL
                                                                                                         В
                                                                                                                          0.75
                                                                                                                                  0.100
                                                                                                                 3.24
                                                                                                                                          32
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  COMMERCIAL
                                                                                                         Α
                                                                                                                          0.98
                                                                                                                                  0.100
                                                                                  RESIDENTIAL
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                     A 4.60
                                                                                                                          0.98 0.600
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 48.16
                                                                                  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.51
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                                  AVERAGE FLOW DEPTH (FEET) = 0.74 FLOOD WIDTH (FEET) = 48.63
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.77
                                                                                  "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.09 Tc (MIN.) = 19.16
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA AREA(ACRES) = 9.56
                                                                                                                 SUBAREA RUNOFF(CFS) = 10.44
   STREET FLOW DEPTH (FEET) = 0.55
                                                                                  EFFECTIVE AREA(ACRES) = 40.94
                                                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.27
   HALFSTREET FLOOD WIDTH (FEET) = 19.38
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.31
                                                                                  TOTAL AREA (ACRES) = 40.9
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.29
                                                                                                                    PEAK FLOW RATE(CFS) =
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.89
 STREET FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 16.07
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.763
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                  END OF SUBAREA "V" GUTTER HYDRAULICS:
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  DEPTH (FEET) = 0.74 FLOOD WIDTH (FEET) = 48.78
     LAND USE
                                0.06
                                                 0.250
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.50 DEPTH*VELOCITY (FT*FT/SEC) = 3.33
 MOBILE HOME PARK
                      В
                                         0.75
 COMMERCIAL
                                1.63
                                         0.75
                                                 0.100
                                                                                  LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20426.00 = 2808.48 FEET.
 RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 1.63
                                                 0.600
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  FLOW PROCESS FROM NODE 20426.00 TO NODE 20427.00 IS CODE = 92
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.348
 SUBAREA AREA (ACRES) = 3.32 SUBAREA RUNOFF (CFS) = 4.49
                                                                                  >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 31.38 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                                ______
 AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.29
                                                                                  UPSTREAM NODE ELEVATION (FEET) = 1685.00
 TOTAL AREA (ACRES) = 31.4 PEAK FLOW RATE (CFS) =
                                                                                  DOWNSTREAM NODE ELEVATION (FEET) = 1676.00
                                                                                  CHANNEL LENGTH THRU SUBAREA (FEET) = 311.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                                  PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                  PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  MAXIMUM DEPTH(FEET) = 1.00
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 19.62
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.547
 FLOW VELOCITY (FEET/SEC.) = 5.32 DEPTH*VELOCITY (FT*FT/SEC.) = 2.93
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20425.00 = 1974.21 FEET.
                                                                                  DEVELOPMENT TYPE/
                                                                                                       SCS SOIL AREA
                                                                                                                                         SCS
                                                                                                        GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
********************
                                                                                                               1.60 0.98
                                                                                                                                  0.100
                                                                                                                                          32
                                                                                  COMMERCIAL
 FLOW PROCESS FROM NODE 20425.00 TO NODE 20426.00 IS CODE = 92
                                                                                  RESIDENTIAL
                                                                                                                                          32
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                         A 6.06
                                                                                                                          0.98
                                                                                                                                  0.600
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                                  RESIDENTIAL
_____
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                         В
                                                                                                               0.60
                                                                                                                          0.75
                                                                                                                                  0.600
 UPSTREAM NODE ELEVATION (FEET) = 1696.00
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
 DOWNSTREAM NODE ELEVATION (FEET) = 1685.00
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.503
 CHANNEL LENGTH THRU SUBAREA (FEET) = 834.27
                                                                                  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 52.37
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.30
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                  AVERAGE FLOW DEPTH(FEET) = 0.69 FLOOD WIDTH(FEET) = 42.50
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                  "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 19.98
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                  SUBAREA AREA (ACRES) = 8.26 SUBAREA RUNOFF (CFS) = 7.93
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.587
                                                                                  EFFECTIVE AREA(ACRES) = 49.20
                                                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.31
```

48.40

Date: 04/21/2014 Page 17 Date: 04/21/2014 File name: LR0204ZZ.RES File name: LR020477.RFS Page 18

```
AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.34
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1664.00
 TOTAL AREA (ACRES) =
                    49.2 PEAK FLOW RATE (CFS) =
                                                         54.87
                                                                                CHANNEL LENGTH THRU SUBAREA (FEET) = 362.52
                                                                                "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                                PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                MAXIMUM DEPTH(FEET) = 1.00
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.456
 DEPTH (FEET) = 0.69 FLOOD WIDTH (FEET) = 43.40
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
 FLOW VELOCITY (FEET/SEC.) = 6.35 DEPTH*VELOCITY (FT*FT/SEC) = 4.40
                                                                                                                   Fp
                                                                                                                                     SCS
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20427.00 = 3120.11 FEET.
                                                                                    LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                COMMERCIAL
                                                                                                     A
                                                                                                            0.97
                                                                                                                      0.98
                                                                                                                              0.100
                                                                                                                                      32
******************
                                                                                RESIDENTIAL
 FLOW PROCESS FROM NODE 20427.00 TO NODE 20428.00 IS CODE = 92
                                                                                "3-4 DWELLINGS/ACRE" A 13.68
                                                                                                                       0.98
                                                                                                                              0.600
                                                                                                   A 3.07
                                                                                                                                      32
                                                                                MOBILE HOME PARK
                                                                                                                      0.98
                                                                                                                              0.250
............
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                                RESIDENTIAL
______
                                                                                "3-4 DWELLINGS/ACRE" B 1.25 0.75 0.600
 UPSTREAM NODE ELEVATION (FEET) = 1676.00
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
 DOWNSTREAM NODE ELEVATION (FEET) = 1668.00
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518
 CHANNEL LENGTH THRU SUBAREA (FEET) = 300.94
                                                                                TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 69.97
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.52
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                AVERAGE FLOW DEPTH(FEET) = 0.83 FLOOD WIDTH(FEET) = 59.08
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 22.13
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                SUBAREA AREA(ACRES) = 18.97
                                                                                                              SUBAREA RUNOFF (CFS) = 16.39
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.511
                                                                                EFFECTIVE AREA(ACRES) = 77.12 AREA-AVERAGED Fm(INCH/HR) = 0.37
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.40
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                TOTAL AREA (ACRES) = 77.1 PEAK FLOW RATE (CFS) =
                                     Fр
                                                      SCS
                                                                                                                                       75.27
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "3-4 DWELLINGS/ACRE" A
                               5.53
                                        0.98
                                                0.600 32
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 COMMERCIAL
                      A
                               0.78
                                        0.98
                                                0.100 32
 MOBILE HOME PARK
                      A
                               2.12
                                       0.98
                                                0.250
                                                                                END OF SUBAREA "V" GUTTER HYDRAULICS:
 RESIDENTIAL
                                                                                DEPTH(FEET) = 0.84 FLOOD WIDTH(FEET) = 60.88
 "3-4 DWELLINGS/ACRE" B 0.52 0.75
                                             0.600 56
                                                                                FLOW VELOCITY (FEET/SEC.) = 4.59 DEPTH*VELOCITY (FT*FT/SEC) = 3.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.96
                                                                                LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20429.00 = 3783.57 FEET.
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.474
                                                                              *******************
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.23
                                                                                FLOW PROCESS FROM NODE 20429.00 TO NODE 20430.00 IS CODE = 63
 AVERAGE FLOW DEPTH (FEET) = 0.71 FLOOD WIDTH (FEET) = 45.64
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 20.79
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AREA(ACRES) = 8.95
                                                                               >>>> (STREET TABLE SECTION # 5 USED) <<<<
                               SUBAREA RUNOFF (CFS) = 8.52
                                                                              ______
 EFFECTIVE AREA(ACRES) = 58.15 AREA-AVERAGED Fm(INCH/HR) = 0.33
 AREA-AVERAGED Fp (INCH/HR) = 0.91 AREA-AVERAGED Ap = 0.36
                                                                                UPSTREAM ELEVATION(FEET) = 1664.00 DOWNSTREAM ELEVATION(FEET) = 1628.00
 TOTAL AREA (ACRES) = 58.1 PEAK FLOW RATE (CFS) = 61.79
                                                                                STREET LENGTH (FEET) = 1363.05 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DEPTH(FEET) = 0.72 FLOOD WIDTH(FEET) = 46.54
 FLOW VELOCITY (FEET/SEC.) = 6.28 DEPTH*VELOCITY (FT*FT/SEC) = 4.52
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20428.00 = 3421.05 FEET.
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 20428.00 TO NODE 20429.00 IS CODE = 92
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
_____
                                                                                  ***STREET FLOWING FULL***
 UPSTREAM NODE ELEVATION (FEET) = 1668.00
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
       Date: 04/21/2014
                                                                                     Date: 04/21/2014
                                                                                                     File name: LR0204ZZ.RES
```

Page 20

File name: LR020477.RFS

Page 19

```
STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.26
 STREET FLOW TRAVEL TIME (MIN.) = 3.58 Tc (MIN.) = 25.71
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               Дp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 21.36
                                      0.98 0.600 32
                             7.94
                                     0.98 0.100 32
 COMMERCIAL
 MOBILE HOME PARK A 14.89
                                     0.98 0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
 SUBAREA AREA (ACRES) = 44.19 SUBAREA RUNOFF (CFS) = 37.70
 EFFECTIVE AREA(ACRES) = 121.31 AREA-AVERAGED Fm(INCH/HR) = 0.38
 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.40
 TOTAL AREA (ACRES) = 121.3 PEAK FLOW RATE (CFS) = 104.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.59
 FLOW VELOCITY (FEET/SEC.) = 6.53 DEPTH*VELOCITY (FT*FT/SEC.) = 4.52
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1363.1 FT WITH ELEVATION-DROP = 36.0 FT, IS 71.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20430.00
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20430.00 = 5146.62 FEET.
*****
 FLOW PROCESS FROM NODE 20430.00 TO NODE 20449.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1628.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
 STREET LENGTH (FEET) = 1350.21 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 109.04
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.06
   HALFSTREET FLOOD WIDTH (FEET) = 45.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.70
```

```
STREET FLOW TRAVEL TIME (MIN.) = 8.80 Tc (MIN.) = 34.51
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.115
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     A 9.50 0.98 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.03 0.98 0.600 32 COMMERCIAL B 0.37 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.147
 SUBAREA AREA (ACRES) = 10.90 SUBAREA RUNOFF (CFS) = 9.54
 EFFECTIVE AREA(ACRES) = 132.21 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.38
 TOTAL AREA(ACRES) = 132.2
                                 PEAK FLOW RATE (CFS) = 104.27
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.04 HALFSTREET FLOOD WIDTH(FEET) = 44.93
 FLOW VELOCITY (FEET/SEC.) = 2.54 DEPTH*VELOCITY (FT*FT/SEC.) = 2.63
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.32
 PIPE-FLOW(CFS) =
                    35.88
 PIPEFLOW TRAVEL TIME (MIN.) = 5.21 Tc (MIN.) = 30.91
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.191
 SUBAREA AREA (ACRES) = 10.90 SUBAREA RUNOFF (CFS) = 10.28
 TOTAL AREA (ACRES) = 132.2 PEAK FLOW RATE (CFS) = 104.27
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 68.39
  ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.90
   HALFSTREET FLOOD WIDTH (FEET) = 38.03
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.08
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.83 FEET.
******************
 FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 30.91
```

File name: LR0204ZZ.RES

Page 22

Date: 04/21/2014

```
RAINFALL INTENSITY (INCH/HR) = 1.19
 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.94
 AREA-AVERAGED Ap = 0.38
 EFFECTIVE STREAM AREA(ACRES) = 132.21
 TOTAL STREAM AREA(ACRES) = 132.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 104.27
******************
 FLOW PROCESS FROM NODE 20440.00 TO NODE 20441.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 918.39
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1706.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.596
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.041
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                             Аp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.48 0.75 0.600 56 12.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 7.85
 TOTAL AREA(ACRES) = 5.48 PEAK FLOW RATE(CFS) = 7.85
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
*****************
 FLOW PROCESS FROM NODE 20441.00 TO NODE 20442.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1706.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH (FEET) = 478.44 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 10.62
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.93
```

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.70
 STREET FLOW TRAVEL TIME (MIN.) = 5.93 Tc (MIN.) = 18.52
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.619
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.22 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.22 SUBAREA RUNOFF (CFS) = 5.50
 EFFECTIVE AREA(ACRES) = 10.70 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 10.7 PEAK FLOW RATE (CFS) = 11.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 1.37 DEPTH*VELOCITY (FT*FT/SEC.) = 0.72
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20442.00 = 1396.83 FEET.
******************
 FLOW PROCESS FROM NODE 20442.00 TO NODE 20443.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1705.00 DOWNSTREAM ELEVATION(FEET) = 1704.00
 STREET LENGTH (FEET) = 220.75 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 18.44
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.98
 STREET FLOW TRAVEL TIME (MIN.) = 1.92 Tc (MIN.) = 20.44
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.527
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                 αA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                               6.59
                                        0.75
                                                0.600 56
```

File name: LR0204ZZ.RES

Page 24

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.59 SUBAREA RUNOFF(CFS) = 6.39
 EFFECTIVE AREA(ACRES) = 17.29 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 17.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.42
 FLOW VELOCITY (FEET/SEC.) = 2.03 DEPTH*VELOCITY (FT*FT/SEC.) = 1.07
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20443.00 = 1617.58 FEET.
*****************
 FLOW PROCESS FROM NODE 20443.00 TO NODE 20444.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1704.00 DOWNSTREAM ELEVATION(FEET) = 1702.00
 STREET LENGTH (FEET) = 263.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.55
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.32
 STREET FLOW TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 22.16
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.454
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                Дp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.15 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 7.15 SUBAREA RUNOFF(CFS) = 6.47
 EFFECTIVE AREA(ACRES) = 24.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 24.4 PEAK FLOW RATE (CFS) = 22.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
```

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.54
 FLOW VELOCITY (FEET/SEC.) = 2.64 DEPTH*VELOCITY (FT*FT/SEC.) = 1.40
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20444.00 = 1881.08 FEET.
*******************
 FLOW PROCESS FROM NODE 20444.00 TO NODE 20445.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1702.00 DOWNSTREAM ELEVATION(FEET) = 1701.00
 STREET LENGTH (FEET) = 498.43 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    27.64
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.22
 STREET FLOW TRAVEL TIME (MIN.) = 4.66 Tc (MIN.) = 26.82
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.297
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.46 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 14.46 SUBAREA RUNOFF (CFS) = 11.04
 EFFECTIVE AREA(ACRES) = 38.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 38.9 PEAK FLOW RATE (CFS) =
                                                          29.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.96
 FLOW VELOCITY (FEET/SEC.) = 1.81 DEPTH*VELOCITY (FT*FT/SEC.) = 1.27
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 498.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 16.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20445.00
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20445.00 = 2379.51 FEET.
```

Page 26

Date: 04/21/2014 File name: LR0204ZZ.RES Page 25 Date: 04/21/2014 File name: LR0204ZZ.RES

```
UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 FLOW PROCESS FROM NODE 20445.00 TO NODE 20446.00 IS CODE = 63
                                                                                  STREET LENGTH (FEET) = 962.00 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
_____
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1701.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 790.41 CURB HEIGHT (INCHES) = 6.0
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     43.05
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    STREET FLOW DEPTH(FEET) = 0.56
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 20.17
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.06
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 36.26
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 3.17 Tc (MIN.) = 38.21
   ***STREET FLOWING FULL***
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.049
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH(FEET) = 0.80
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fp
   HALFSTREET FLOOD WIDTH (FEET) = 33.09
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.60
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 2.08
                                                                                                                          0.75
                                                                                                                                  0.600
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 STREET FLOW TRAVEL TIME (MIN.) = 8.22 Tc (MIN.) = 35.04
                                                                                  RESIDENTIAL
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.105
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                      A 24.90 0.98 0.600
                                                                                                                                          32
                                                                                                               1.29
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                  SCHOOL
                                                                                                                          0.98
                                                                                                                                  0.600
                                                                                                                                          32
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                 3.53
                                                                                                                                  0.600 56
                                                                                  SCHOOL
                                                                                                         R
                                                                                                                          0.75
                                                        SCS
      LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 RESIDENTIAL
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 "3-4 DWELLINGS/ACRE" B 22.19 0.75 0.600 56
                                                                                  SUBAREA AREA (ACRES) = 31.80 SUBAREA RUNOFF (CFS) = 13.96
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  EFFECTIVE AREA(ACRES) = 92.89 AREA-AVERAGED Fm(INCH/HR) = 0.49
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.60
 SUBAREA AREA (ACRES) = 22.19 SUBAREA RUNOFF (CFS) = 13.10
                                                                                  TOTAL AREA (ACRES) = 92.9 PEAK FLOW RATE (CFS) =
                                                                                                                                           46.94
 EFFECTIVE AREA(ACRES) = 61.09 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 61.1 PEAK FLOW RATE (CFS) =
                                                          36.06
                                                                                   5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                                  DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 20.87
                                                                                  FLOW VELOCITY (FEET/SEC.) = 5.16 DEPTH*VELOCITY (FT*FT/SEC.) = 2.97
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20447.00 = 4131.92 FEET.
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 33.03
                                                                                 ******************
 FLOW VELOCITY (FEET/SEC.) = 1.60 DEPTH*VELOCITY (FT*FT/SEC.) = 1.28
                                                                                  FLOW PROCESS FROM NODE 20447.00 TO NODE 20448.00 IS CODE = 63
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 790.4 FT WITH ELEVATION-DROP = 1.0 FT, IS 19.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20446.00
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20446.00 = 3169.92 FEET.
                                                                                  >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 _____
******************
                                                                                  UPSTREAM ELEVATION (FEET) = 1670.00 DOWNSTREAM ELEVATION (FEET) = 1645.00
 FLOW PROCESS FROM NODE 20446.00 TO NODE 20447.00 IS CODE = 63
                                                                                  STREET LENGTH (FEET) = 877.54 CURB HEIGHT (INCHES) = 8.0
                                                                                  STREET HALFWIDTH (FEET) = 26.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014

File name: LR0204ZZ.RES

STREET LENGTH (FEET) = 820.27 CURB HEIGHT (INCHES) = 8.0

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

STREET HALFWIDTH (FEET) = 26.00

Date: 04/21/2014

File name: LR0204ZZ.RES Page 29

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.68HALFSTREET FLOOD WIDTH (FEET) = 26.61 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.24 PRODUCT OF DEPTH&VELOCITY (FT\*FT/SEC.) = 3.56 STREET FLOW TRAVEL TIME (MIN.) = 2.61 Tc (MIN.) = 43.61 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.969 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA SCS GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL A 3.48 0.98 0.100 32 COMMERCIAL В 6.53 0.75 0.100 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" A 0.34 0.98 0.600 32 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.38 0.75 0.600 56 SCHOOL 0.64 0.98 0.600 32 16.30 SCHOOT. В 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425 SUBAREA AREA(ACRES) = 28.67 SUBAREA RUNOFF(CFS) = 16.60 EFFECTIVE AREA(ACRES) = 159.38 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.53 TOTAL AREA(ACRES) = 159.4 PEAK FLOW RATE(CFS) = 77.06 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.69 HALFSTREET FLOOD WIDTH(FEET) = 27.03 FLOW VELOCITY (FEET/SEC.) = 5.35 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.68 LONGEST FLOWPATH FROM NODE 20440.00 TO NODE 20449.00 = 5829.73 FEET. \* FLOW PROCESS FROM NODE 20449.00 TO NODE 20449.00 IS CODE = 1 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<< >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES< \_\_\_\_\_\_ TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE: TIME OF CONCENTRATION (MIN.) = 43.61RAINFALL INTENSITY (INCH/HR) = 0.97AREA-AVERAGED Fm(INCH/HR) = 0.43AREA-AVERAGED Fp (INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.53EFFECTIVE STREAM AREA(ACRES) = 159.38 TOTAL STREAM AREA(ACRES) = 159.38 PEAK FLOW RATE (CFS) AT CONFLUENCE = \*\* CONFLUENCE DATA \*\*

HEADWATER

Page 30

STREAM Q Tc Intensity Fp(Fm)

File name: LR0204ZZ.RES

Date: 04/21/2014

NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 104.27 30.91 1.191 0.94(0.36) 0.38 132.2 20420.00	"3-4 DWELLINGS/ACRE" B 8.18 0.75 0.600 56 RESIDENTIAL
2 77.06 43.61 0.969 0.81 (0.43) 0.53 159.4 20440.00	"3-4 DWELLINGS/ACRE" A 7.04 0.98 0.600 32
	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.292
CONFLUENCE FORMULA USED FOR 2 STREAMS.	SUBAREA AREA (ACRES) = 100.18 SUBAREA RUNOFF (CFS) = 81.36
CONFIDENCE FORMULA COLD FOR 2 STREAMS.	EFFECTIVE AREA (ACRES) = 345.37 AREA-AVERAGED Fm (INCH/HR) = 0.34
** PEAK FLOW RATE TABLE **	AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.40
STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER	TOTAL AREA (ACRES) = 391.8 PEAK FLOW RATE (CFS) = 243.90
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 181.33 30.91 1.191 0.87(0.39) 0.45 245.2 20420.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
2 153.58 43.61 0.969 0.86(0.40) 0.46 291.6 20440.00	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
COMPUTED CONTURED FORTMARIO AND AC FOLLOWS.	THE OF GUIDANTA CENTERS IN ON HARDAULTOCA
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:	END OF SUBAREA STREET FLOW HYDRAULICS:
PEAK FLOW RATE (CFS) = 181.33 Tc (MIN.) = 30.91	DEPTH (FEET) = 0.95 HALFSTREET FLOOD WIDTH (FEET) = 40.34
EFFECTIVE AREA (ACRES) = 245.19 AREA-AVERAGED Fm (INCH/HR) = 0.39	FLOW VELOCITY (FEET/SEC.) = 7.55 DEPTH*VELOCITY (FT*FT/SEC.) = 7.19
AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.45	ANOME, POSTANASED OSDERS STAN DEDSE TO ODERSED SUNN
TOTAL AREA(ACRES) = 291.6 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20449.00 = 6496.83 FEET.	*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
EONGESI FLOWPAIN FROM NODE 20420.00 TO NODE 20449.00 - 0490.03 FEEL.	THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
*************	** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
FLOW PROCESS FROM NODE 20449.00 TO NODE 20450.00 IS CODE = 63	ESTIMATED PIPE DIAMETER (INCH) = 30.00 NUMBER OF PIPES = 1
FLOW PROCESS FROM NODE 20449.00 TO NODE 204J0.00 IS CODE - 03	ASSUME FULL-FLOWING PIPELINE
	PIPE-FLOW VELOCITY (FEET/SEC.) = 11.67
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>> (STREET TABLE SECTION # 18 USED) <>>>	PIPE-FLOW VELOCITI (FEET/SEC.) = 11.67 PIPE-FLOW (CFS) = 57.35
	PIPEFLOW (Crs) = 37.33 PIPEFLOW TRAVEL TIME (MIN.) = 1.86 Tc (MIN.) = 32.78
UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1595.00	* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.150
STREET LENGTH (FEET) = 1304.02 CURB HEIGHT (INCHES) = 8.0	SUBAREA AREA (ACRES) = 100.18 SUBAREA RUNOFF (CFS) = 83.38
STREET HALFWIDTH (FEET) = 26.00	TOTAL AREA (ACRES) = 391.8 PEAK FLOW RATE (CFS) = 250.87
SINDEL HADIWICEBLY - 20.00	TOTAL AND (ACKED) - 331.0 TEAN THOW MATE (CES) - 230.07
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 15.00	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
INSIDE STREET CROSSFALL (DECIMAL) = 0.020	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	STREETFLOW HYDRAULICS BASED ON MAINLINE To:
OUTSIDE STABLE CHOOSTABL (DECTEE)	STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 193.52
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2	***STREET FLOWING FULL***
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180	STREET FLOW DEPTH (FEET) = 0.89
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200	HALFSTREET FLOOD WIDTH (FEET) = 37.11
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.89	AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.08
TEMPON TEMPONEDE STREET FEW DELTH(TEMP)	PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.30
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 222.00	TROBOOT OF BELLIAVE EDOCTIVE TIMES OF STATE OF S
***STREET FLOWING FULL***	** PEAK FLOW RATE TABLE **
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:	STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER
STREET FLOW DEPTH(FEET) = 0.93	NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
HALFSTREET FLOOD WIDTH (FEET) = 39.00	1 250.87 32.78 1.150 0.85 ( 0.34 ) 0.40 345.4 20420.00
AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.35	2 207.96 45.61 0.943 0.85 (0.35) 0.42 391.8 20440.00
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.81	NEW PEAK FLOW DATA ARE:
STREET FLOW TRAVEL TIME (MIN.) = 2.96 Tc (MIN.) = 33.87	PEAK FLOW RATE (CFS) = 250.87 Tc (MIN.) = 32.78
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.127	AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.85
SUBAREA LOSS RATE DATA (AMC II):	AREA-AVERAGED Ap = 0.40 EFFECTIVE AREA(ACRES) = 345.37
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20450.00 = 7800.85 FEET.
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	
COMMERCIAL A 33.74 0.98 0.100 32	****************
MOBILE HOME PARK B 22.38 0.75 0.250 56	FLOW PROCESS FROM NODE 20450.00 TO NODE 20451.00 IS CODE = 54
COMMERCIAL B 19.61 0.75 0.100 56	
AGRICULTURAL FAIR COVER	>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
"ORCHARDS" B 9.23 0.63 1.000 65	>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)
RESIDENTIAL	=======================================

 Date: 04/21/2014
 File name: LR0204ZZ.RES
 Page 31
 Date: 04/21/2014
 File name: LR0204ZZ.RES
 Page 32

```
ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1530.00
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2921.86 CHANNEL SLOPE = 0.0222
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                       Αp
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
                                                                               LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
                                                                           RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              250.87
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                              В
                                                                                                       6.50
                                                                                                                0.75
                                                                                                                       0.600
                                                                                                В
                                                                                                       3.31
 FLOW VELOCITY (FEET/SEC.) = 8.44 FLOW DEPTH (FEET) = 2.10
                                                                           COMMERCIAL
                                                                                                               0.75
                                                                                                                       0.100
 TRAVEL TIME (MIN.) = 5.77 Tc (MIN.) = 38.55
                                                                           RESIDENTIAL
                                                                                                       0.25
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20451.00 = 10722.71 FEET.
                                                                           "3-4 DWELLINGS/ACRE" A
                                                                                                                0.98
                                                                                                                       0.600
                                                                           NATURAL FAIR COVER
*******************
                                                                                                       0.07
                                                                                                               0.61 1.000
                                                                           "OPEN BRUSH"
                                                                                                В
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20451.00 IS CODE = 81
                                                                           PUBLIC PARK
                                                                                                       0.12
                                                                                                               0.75 0.850
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.444
_____
                                                                           SUBAREA AREA(ACRES) = 10.25
                                                                                                       SUBAREA RUNOFF (CFS) = 6.13
 MAINLINE Tc(MIN.) = 38.55
                                                                           EFFECTIVE AREA(ACRES) = 400.34 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.48
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.043
 SUBAREA LOSS RATE DATA(AMC II):
                                                                           TOTAL AREA(ACRES) = 446.7 PEAK FLOW RATE(CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                  Fр
                                           Ар
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "3-4 DWELLINGS/ACRE"
                   В
                         19.78
                                     0.75
                                             0.600 56
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
 COMMERCIAL
                     В
                            5.95
                                     0.75
                                             0.100 56
                                                                         ******************
 MOBILE HOME PARK
                      В
                             6.72
                                     0.75
                                             0.250 56
 PUBLIC PARK
                      В
                             6.76
                                     0.75
                                            0.850
                                                    56
                                                                           FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 11
 SCHOOL
                             5.51
                                     0.75
                                             0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.519
                                                                         ______
 SUBAREA AREA(ACRES) = 44.72
                            SUBAREA RUNOFF (CFS) = 26.37
 EFFECTIVE AREA(ACRES) = 390.09 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           ** MAIN STREAM CONFLUENCE DATA **
                                                                           STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.48
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 TOTAL AREA (ACRES) = 436.5 PEAK FLOW RATE (CFS) = 250.87
                                                                           NUMBER
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                            1
                                                                                    250.87 41.39 1.000 0.83(0.35) 0.42 400.3 20420.00
                                                                                    207.96 54.73 0.845 0.83(0.36) 0.43 446.7 20440.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20452.00 = 11995.84 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
                                                                           ** MEMORY BANK # 1 CONFLUENCE DATA **
******************
                                                                           PEAK FLOW RATE (CFS) = 1877.19 Tc (MIN.) = 49.71
 FLOW PROCESS FROM NODE 20451.00 TO NODE 20452.00 IS CODE = 54
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.58 Ybar = 0.64
______
                                                                           TOTAL AREA (ACRES) = 4897.4
                                                                           LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 ELEVATION DATA: UPSTREAM(FEET) = 1530.00 DOWNSTREAM(FEET) = 1510.00
                                                                           UNIT-HYDROGRAPH DATA:
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1273.13 CHANNEL SLOPE = 0.0157
                                                                           RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.47;6H= 2.15;24H= 4.50
 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000
                                                                           S-GRAPH: VALLEY(DEV.) = 49.2%; VALLEY(UNDEV.)/DESERT= 50.8%
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 5.00
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 CHANNEL FLOW THRU SUBAREA(CFS) = 250.87
                                                                           Tc(HR) = 0.83; LAG(HR) = 0.66; Fm(INCH/HR) = 0.56; Ybar = 0.63
 FLOW VELOCITY (FEET/SEC.) = 7.47 FLOW DEPTH (FEET) = 2.30
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 41.39
                                                                           DEPTH-AREA FACTORS: 5M = 0.78; 30M = 0.78; 1HR = 0.78;
 LONGEST FLOWPATH FROM NODE 20420.00 TO NODE 20452.00 = 11995.84 FEET.
                                                                           3HR = 0.97; 6HR = 0.98; 24HR = 0.99
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 5344.1
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20452.00 = 27096.44 FEET.
 FLOW PROCESS FROM NODE 20452.00 TO NODE 20452.00 IS CODE = 81
                                                                           EOUIVALENT BASIN FACTOR APPROXIMATIONS:
______
                                                                           Lca/L=0.3,n=.0377; Lca/L=0.4,n=.0338; Lca/L=0.5,n=.0310; Lca/L=0.6,n=.0289
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 784.44
______
                                                                           PEAK FLOW RATE (CFS) = 2044.74
 MAINLINE Tc (MIN.) = 41.39
                                                                         * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.000
```

SCS

56

56

250.87

Date: 04/21/2014 Date: 04/21/2014 File name: LR0204ZZ.RES File name: LR020477.RFS Page 33 Page 34

```
******************
 FLOW PROCESS FROM NODE 20453.00 TO NODE 20454.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1395.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3128.68 CHANNEL SLOPE = 0.0144
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 2044.74
 FLOW VELOCITY (FEET/SEC.) = 23.61 FLOW DEPTH (FEET) = 4.23
 TRAVEL TIME (MIN.) = 2.21 Tc (MIN.) = 54.02
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 54.02
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.852
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                       Fρ
                                                      SCS
                                                Αp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SCHOOL
                        В
                              17.44
                                       0.75
                                               0.600
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                               3.70
                                        0.75
                                               0.600
                                                       56
 PUBLIC PARK
                        В
                               9.17
                                       0.75
                                               0.850
                                                       56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      В
                               5.37
                                        0.75
                                               0.500
                                                       56
                                       0.75
                                               0.100
                                                       56
 COMMERCIAL
                        В
                               1.64
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625
 SUBAREA AREA(ACRES) = 37.32
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.47;6H= 2.14;24H= 4.49
 S-GRAPH: VALLEY(DEV.) = 50.1%; VALLEY(UNDEV.) / DESERT = 49.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.55; Ybar = 0.62
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.78; 30M = 0.78; 1HR = 0.78;
 3HR = 0.97; 6HR = 0.98; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0338; Lca/L=0.4, n=.0303; Lca/L=0.5, n=.0278; Lca/L=0.6, n=.0260
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 800.38
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 2008.33
 TOTAL AREA (ACRES) = 5435.8
                                PEAK FLOW RATE (CFS) = 2044.74
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88
```

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.88

Date: 04/21/2014 File name: LR0204ZZ.RES Page 35 Date: 04/21/2014 File name: LR0204ZZ.RES Page 36

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0204ZZ.RES Page 37 Date: 04/21/2014 File name: LR0204ZZ.RES Page 38

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20539

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0205ZZ.DAT

14

15

39.0

36.0

16 12.5

20.0

20.0

5.0

Date: 04/21/2014

TIME/DATE OF STUDY: 07:49 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00 SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0313 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 0.020/0.020/0.020 16.0 10.0 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

0.020/0.020/0.020

0.020/0.020/0.020

0.020/0.020/0.020 0.50

File name: LR020577.RFS

0.67

0.67

2.00 0.0312 0.167 0.0180

2.00 0.0312 0.167 0.0180

1.50 0.0312 0.125 0.0180

Page 1

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20500.00 TO NODE 20501.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 672.35 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1591.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.525 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.800 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Aρ SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" 2.95 0.75 0.600 56 15.53 RESIDENTIAL "3-4 DWELLINGS/ACRE" 0.88 0.98 0.600 32 15.53 AGRICULTURAL FAIR COVER 1.000 "ORCHARDS" 0.12 0.88 44 26.60 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.612 SUBAREA RUNOFF (CFS) = 4.65 TOTAL AREA (ACRES) = 3.95 PEAK FLOW RATE (CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90FLOW PROCESS FROM NODE 20501.00 TO NODE 20502.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 File name: LR0205ZZ.RES Page 2

\_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1591.00 DOWNSTREAM ELEVATION(FEET) = 1587.00

>>>> (STREET TABLE SECTION # 5 USED) <<<<

```
STREET LENGTH (FEET) = 262.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.38
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 12.57
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.25
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.23
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 18.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 6.73
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.604
   STREET FLOW DEPTH (FEET) = 0.35
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 11.16
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.47
                                                                                      LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.86
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 2.45
 STREET FLOW TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 17.30
                                                                                                                          0.75
                                                                                                                                  0.600
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.687
                                                                                  MOBILE HOME PARK
                                                                                                      в 1.73
                                                                                                                          0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" A 0.21
MOBILE HOME PARK A 0.20
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                                                          0.98
                                                                                                                                  0.600
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                                          0.98 0.250
 RESIDENTIAL
                                                                                  AGRICULTURAL FAIR COVER
 "3-4 DWELLINGS/ACRE" B 3.30
                                         0.75
                                                 0.600
                                                       56
                                                                                  "ORCHARDS"
                                                                                                         A 0.11 0.88 1.000 44
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.37
                                         0.98
                                                 0.600
                                                       32
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466
 AGRICULTURAL FAIR COVER
                                                                                  SUBAREA AREA (ACRES) = 4.70 SUBAREA RUNOFF (CFS) = 5.26
                                                                                  EFFECTIVE AREA(ACRES) = 12.48 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                0.16 0.88 1.000 44
 "ORCHARDS"
                        Α
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.56
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.617
                                                                                  TOTAL AREA (ACRES) = 12.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA (ACRES) = 3.83 SUBAREA RUNOFF (CFS) = 4.16
 EFFECTIVE AREA(ACRES) = 7.78 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.61
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 TOTAL AREA (ACRES) = 7.8 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.43
                                                                                  FLOW VELOCITY (FEET/SEC.) = 3.41 DEPTH*VELOCITY (FT*FT/SEC.) = 1.34
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
                                                                                  LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20503.00 = 1231.69 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.37 HALFSTREET FLOOD WIDTH (FEET) = 12.26
                                                                                ******************
 FLOW VELOCITY (FEET/SEC.) = 2.59 DEPTH*VELOCITY (FT*FT/SEC.) = 0.96
                                                                                  FLOW PROCESS FROM NODE 20503.00 TO NODE 20504.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20502.00 = 935.03 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
******************
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                _____
 FLOW PROCESS FROM NODE 20502.00 TO NODE 20503.00 IS CODE = 63
______
                                                                                  UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
                                                                                  STREET LENGTH (FEET) = 416.03 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
______
 UPSTREAM ELEVATION(FEET) = 1587.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 296.66 CURB HEIGHT (INCHES) = 6.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

56

56

32

13.09

0.250

Date: 04/21/2014 File name: LR0205ZZ.RES Date: 04/21/2014 File name: LR0205ZZ.RES Page 3 Page 4

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.87
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.42
   HALFSTREET FLOOD WIDTH (FEET) = 14.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.54
 STREET FLOW TRAVEL TIME (MIN.) = 1.91 Tc (MIN.) = 20.73
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.514
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.28
                                     0.75
                                              0.600 56
 MOBILE HOME PARK
                      В
                              5.56
                                        0.75
                                                0.250 56
 MOBILE HOME PARK A
                               0.58
                                        0.98
                                               0.250 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.265
 SUBAREA AREA (ACRES) = 6.42 SUBAREA RUNOFF (CFS) = 7.57
 EFFECTIVE AREA(ACRES) = 18.90 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp (INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = 19.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.77
 FLOW VELOCITY (FEET/SEC.) = 3.77 DEPTH*VELOCITY (FT*FT/SEC.) = 1.66
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20504.00 = 1647.72 FEET.
*****************
 FLOW PROCESS FROM NODE 20504.00 TO NODE 20505.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1560.00
 STREET LENGTH (FEET) = 387.53 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 22.49
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.01
```

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.82
 STREET FLOW TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 22.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.447
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.33
                                        0.75 0.600
                     В
                              1.58 0.75 0.250 56
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.506
 SUBAREA AREA (ACRES) = 5.91 SUBAREA RUNOFF (CFS) = 5.68
 EFFECTIVE AREA(ACRES) = 24.81 AREA-AVERAGED Fm(INCH/HR) = 0.36
 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.47
 TOTAL AREA (ACRES) = 24.8 PEAK FLOW RATE (CFS) =
                                                        24.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.87
 FLOW VELOCITY (FEET/SEC.) = 4.08 DEPTH*VELOCITY (FT*FT/SEC.) = 1.89
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20505.00 = 2035.25 FEET.
******************
 FLOW PROCESS FROM NODE 20505.00 TO NODE 20506.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1560.00 DOWNSTREAM ELEVATION(FEET) = 1535.00
 STREET LENGTH (FEET) = 1240.51 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.00
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.51
  HALFSTREET FLOOD WIDTH (FEET) = 18.56
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.07
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.08
 STREET FLOW TRAVEL TIME (MIN.) = 5.08 Tc (MIN.) = 27.42
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.280
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                αA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              14.33 0.75
                                                0.600
```

Date: 04/21/2014 File name: LR0205ZZ.RES

Page 6

```
RESIDENTIAL.
 "3-4 DWELLINGS/ACRE" A 4.53 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 18.86 SUBAREA RUNOFF (CFS) = 13.55
 EFFECTIVE AREA(ACRES) = 43.67 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AREA-AVERAGED Fp(INCH/HR) = 0.79 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 43.7
                               PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 19.17
 FLOW VELOCITY (FEET/SEC.) = 4.21 DEPTH*VELOCITY (FT*FT/SEC.) = 2.20
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20506.00 = 3275.76 FEET.
FLOW PROCESS FROM NODE 20506.00 TO NODE 20507.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1535.00 DOWNSTREAM ELEVATION(FEET) = 1518.00
 STREET LENGTH (FEET) = 947.01 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.34
 STREET FLOW TRAVEL TIME (MIN.) = 3.72 Tc (MIN.) = 31.14
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.186
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.54
                                        0.75
                                                0.600 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 9.86
                                        0.98
                                              0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 16.40 SUBAREA RUNOFF (CFS) = 9.67
 EFFECTIVE AREA(ACRES) = 60.07 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.55
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.70
 FLOW VELOCITY (FEET/SEC.) = 4.30 DEPTH*VELOCITY (FT*FT/SEC.) = 2.38
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20507.00 = 4222.77 FEET.
******************
 FLOW PROCESS FROM NODE 20507.00 TO NODE 20508.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1490.50
 STREET LENGTH (FEET) = 1523.12 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     44.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.49
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.55
 STREET FLOW TRAVEL TIME (MIN.) = 5.68 Tc (MIN.) = 36.82
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.072
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.25 0.75 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 6.62 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.83
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 17.87 SUBAREA RUNOFF(CFS) = 9.22
 EFFECTIVE AREA(ACRES) = 77.94 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.82 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 77.9 PEAK FLOW RATE (CFS) =
                                                        43.07
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.25
```

TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) =

39.98

```
FLOW VELOCITY (FEET/SEC.) = 4.41 DEPTH*VELOCITY (FT*FT/SEC.) = 2.49
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20508.00 = 5745.89 FEET.
FLOW PROCESS FROM NODE 20508.00 TO NODE 20509.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1490.50 DOWNSTREAM ELEVATION(FEET) = 1490.00
 STREET LENGTH (FEET) = 621.21 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.94
   HALFSTREET FLOOD WIDTH (FEET) = 39.67
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.39
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.31
 STREET FLOW TRAVEL TIME (MIN.) = 7.44 Tc (MIN.) = 44.26
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.960
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 2.36
                                       0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA (ACRES) = 2.36 SUBAREA RUNOFF (CFS) = 0.82
 EFFECTIVE AREA(ACRES) = 80.30 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp (INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 80.3 PEAK FLOW RATE (CFS) =
                                                        43.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 39.55
 FLOW VELOCITY (FEET/SEC.) = 1.39 DEPTH*VELOCITY (FT*FT/SEC.) = 1.30
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20509.00 = 6367.10 FEET.
*****************
 FLOW PROCESS FROM NODE 20509.00 TO NODE 20518.00 IS CODE = 63
```

```
>>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1489.50
 STREET LENGTH (FEET) = 654.22 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    43.46
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.95
   HALFSTREET FLOOD WIDTH (FEET) = 40.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.29
 STREET FLOW TRAVEL TIME (MIN.) = 7.99 Tc (MIN.) = 52.25
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.869
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                        SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      A 2.47 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA (ACRES) = 2.47 SUBAREA RUNOFF (CFS) = 0.77
 EFFECTIVE AREA(ACRES) = 82.77 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.83 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 82.8
                                 PEAK FLOW RATE (CFS) = 43.07
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.94 HALFSTREET FLOOD WIDTH(FEET) = 39.91
 FLOW VELOCITY (FEET/SEC.) = 1.36 DEPTH*VELOCITY (FT*FT/SEC.) = 1.29
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
******************
  FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 52.25
 RAINFALL INTENSITY (INCH/HR) = 0.87
```

File name: LR020577.RFS

Page 10

Date: 04/21/2014

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

```
AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.83
 AREA-AVERAGED Ap = 0.56
 EFFECTIVE STREAM AREA(ACRES) = 82.77
 TOTAL STREAM AREA(ACRES) = 82.77
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                 43.07
******************
 FLOW PROCESS FROM NODE 20510.00 TO NODE 20511.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.77
 ELEVATION DATA: UPSTREAM(FEET) = 1595.00 DOWNSTREAM(FEET) = 1590.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.909
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.357
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 Αp
                                                       SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.24
                                      0.98
                                                0.600
                                                      32 13.43
 AGRICULTURAL FAIR COVER
                                                1.000
 "ORCHARDS"
                      A 0.98
                                        0.88
                                                      44 23.01
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                               0.57
                                        0.75
                                                0.600
                                                       56 13.43
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               1.82
                                        0.63
                                              1.000
                                                      65 23.01
                        В
                               0.06
                                        0.75 0.100 56 9.91
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.897
 SUBAREA RUNOFF (CFS) = 5.62
 TOTAL AREA (ACRES) = 3.67 PEAK FLOW RATE (CFS) = 5.62
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
*********************
 FLOW PROCESS FROM NODE 20511.00 TO NODE 20512.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
 STREET LENGTH (FEET) = 249.41 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     8.89
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.36
   HALFSTREET FLOOD WIDTH (FEET) = 9.84
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.36
 STREET FLOW TRAVEL TIME (MIN.) = 1.08 Tc (MIN.) = 10.99
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.215
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                               Aр
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                            1.59
                                         0.88
                                                 1.000
                                                         44
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      B 2.00
                                         0.63
                                                1.000
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.46
                                         0.75 0.600
 MOBILE HOME PARK
                      В
                              0.58
                                         0.75 0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.866
 SUBAREA AREA (ACRES) = 4.63 SUBAREA RUNOFF (CFS) = 6.55
 EFFECTIVE AREA(ACRES) = 8.30 AREA-AVERAGED Fm(INCH/HR) = 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 8.3 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 11.15
 FLOW VELOCITY (FEET/SEC.) = 4.09 DEPTH*VELOCITY (FT*FT/SEC.) = 1.56
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20512.00 = 818.18 FEET.
******************
 FLOW PROCESS FROM NODE 20512.00 TO NODE 20513.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1575.00
 STREET LENGTH (FEET) = 306.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.98
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 16.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 15.78
```

Date: 04/21/2014 File name: LR0205ZZ.RES

Page 12

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.16
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.50
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                                        SCS
                                                                                                                        Fρ
                                                                                                                                 Αp
                                                                                     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 STREET FLOW TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 12.61

        MOBILE HOME PARK
        A
        3.78
        0.98
        0.250

        MOBILE HOME PARK
        B
        6.42
        0.75
        0.250

 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.040
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.82 0.75 0.600
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.82
 "ORCHARDS"
             A
                              1.37
                                         0.88
                                                1.000
                                                       44
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.276
                              1.25
                                         0.98
                                                 0.250
                                                       32
 MOBILE HOME PARK
                      A
                                                                                 SUBAREA AREA(ACRES) = 11.02 SUBAREA RUNOFF(CFS) = 16.15
                                                                                 EFFECTIVE AREA(ACRES) = 26.50 AREA-AVERAGED Fm(INCH/HR) = 0.41
 AGRICULTURAL FAIR COVER
                              1.07
                                                1.000 65
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.53
 "ORCHARDS"
                      В
                                         0.63
 MOBILE HOME PARK
                      В
                                2.91
                                         0.75
                                                0.250 56
                                                                                 TOTAL AREA (ACRES) = 26.5 PEAK FLOW RATE (CFS) =
                                                                                                                                         34.46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.58
                                         0.75 0.600 56
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.78
                                                                                 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.37: 6HR = 1.92: 24HR = 3.90
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.533
 SUBAREA AREA (ACRES) = 7.18 SUBAREA RUNOFF (CFS) = 10.49
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 15.48 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                                 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.28
                                                                                 FLOW VELOCITY (FEET/SEC.) = 3.34 DEPTH*VELOCITY (FT*FT/SEC.) = 2.02
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 15.5 PEAK FLOW RATE (CFS) =
                                                         20.89
                                                                                 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20514.00 = 1541.21 FEET.
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
                                                                                 FLOW PROCESS FROM NODE 20514.00 TO NODE 20515.00 IS CODE = 63
                                                                                ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 17.18
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                _____
 FLOW VELOCITY (FEET/SEC.) = 3.32 DEPTH*VELOCITY (FT*FT/SEC.) = 1.67
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20513.00 = 1124.68 FEET.
                                                                                 UPSTREAM ELEVATION(FEET) = 1570.00 DOWNSTREAM ELEVATION(FEET) = 1565.00
                                                                                 STREET LENGTH (FEET) = 392.53 CURB HEIGHT (INCHES) = 8.0
******************
                                                                                 STREET HALFWIDTH (FEET) = 26.00
 FLOW PROCESS FROM NODE 20513.00 TO NODE 20514.00 IS CODE = 63
______
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1575.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 416.53 CURB HEIGHT (INCHES) = 8.0
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.51
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   STREET FLOW DEPTH (FEET) = 0.63
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 23.69
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.58
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.06
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 16.60
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.729
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
                                                                                                                                αA
                                                                                                                                        SCS
   STREET FLOW DEPTH (FEET) = 0.57
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                              5.83 0.75 0.250
   HALFSTREET FLOOD WIDTH (FEET) = 20.81
                                                                                 MOBILE HOME PARK
                                                                                                      В
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.20
                                                                                 RESIDENTIAL
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.84
                                                                                 "3-4 DWELLINGS/ACRE" B 4.98 0.75 0.600
                                                                                                                                         56
                                                                                 MOBILE HOME PARK A 0.20 0.98 0.250
 STREET FLOW TRAVEL TIME (MIN.) = 2.17 Tc (MIN.) = 14.77
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.855
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014 File name: LR0205ZZ.RES Page 13

Date: 04/21/2014 File name: LR0205ZZ.RES

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 SUBAREA AREA (ACRES) = 11.01 SUBAREA RUNOFF (CFS) = 14.10
 EFFECTIVE AREA(ACRES) = 37.51 AREA-AVERAGED Fm(INCH/HR) = 0.38
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.50
                                                                                 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 25.58
 TOTAL AREA(ACRES) = 37.5 PEAK FLOW RATE(CFS) = 45.57
                                                                                 FLOW VELOCITY (FEET/SEC.) = 5.65 DEPTH*VELOCITY (FT*FT/SEC.) = 3.77
                                                                                 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20516.00 = 3149.32 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                *******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
                                                                                 FLOW PROCESS FROM NODE 20516.00 TO NODE 20517.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                ______
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.56
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY(FEET/SEC.) = 3.66 DEPTH*VELOCITY(FT*FT/SEC.) = 2.38
                                                                                 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20515.00 = 1933.74 FEET.
                                                                                ______
                                                                                 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1510.00
*****************
                                                                                 STREET LENGTH (FEET) = 1115.01 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 20515.00 TO NODE 20516.00 IS CODE = 63
                                                                                 STREET HALFWIDTH (FEET) = 26.00
______
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1565.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
 STREET LENGTH (FEET) = 1215.58 CURB HEIGHT (INCHES) = 8.0
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 26.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.95
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH(FEET) = 0.74
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 29.66
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.11
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.78
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   63.98
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 3.64 Tc (MIN.) = 23.98
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.387
   STREET FLOW DEPTH (FEET) = 0.64
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 23.92
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.41
                                                                                      LAND USE
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.44
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 3.74 Tc (MIN.) = 20.35
                                                                                 "3-4 DWELLINGS/ACRE" A 23.04 0.98 0.600
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.531
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 11.30
                                                                                                                         0.75 0.600
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                 SUBAREA AREA (ACRES) = 34.34 SUBAREA RUNOFF (CFS) = 26.17
 "3-4 DWELLINGS/ACRE" B 20.48
                                         0.75
                                                0.600 56
                                                                                 EFFECTIVE AREA(ACRES) = 106.98 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.81 AREA-AVERAGED Ap = 0.52
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 2.53
                                      0.98
                                               0.600 32
                                                                                 TOTAL AREA (ACRES) = 107.0 PEAK FLOW RATE (CFS) =
                                                0.250 56
 MOBILE HOME PARK
                      В 12.12
                                      0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.77
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.479
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 SUBAREA AREA (ACRES) = 35.13 SUBAREA RUNOFF (CFS) = 36.75
 EFFECTIVE AREA(ACRES) = 72.64 AREA-AVERAGED Fm(INCH/HR) = 0.37
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.49
                                                                                 DEPTH(FEET) = 0.75 HALFSTREET FLOOD WIDTH(FEET) = 30.03
 TOTAL AREA (ACRES) = 72.6 PEAK FLOW RATE (CFS) =
                                                                                 FLOW VELOCITY (FEET/SEC.) = 5.19 DEPTH*VELOCITY (FT*FT/SEC.) = 3.88
                                                                                 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20517.00 = 4264.33 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0205ZZ.RES Page 15 File name: LR0205ZZ.RES Page 16

Date: 04/21/2014

88.74

αA

SCS

32

92.38

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 20517.00 TO NODE 20518.00 IS CODE = 63
                                                                             TIME OF CONCENTRATION (MIN.) = 28.34
_____
                                                                             RAINFALL INTENSITY (INCH/HR) = 1.25
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             AREA-AVERAGED Fm(INCH/HR) = 0.47
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.86
_____
                                                                             AREA-AVERAGED Ap = 0.55
 UPSTREAM ELEVATION (FEET) = 1510.00 DOWNSTREAM ELEVATION (FEET) = 1489.50
                                                                             EFFECTIVE STREAM AREA(ACRES) = 148.93
                                                                             TOTAL STREAM AREA(ACRES) = 148.93
 STREET LENGTH (FEET) = 1340.04 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                             PEAK FLOW RATE (CFS) AT CONFLUENCE = 105.44
                                                                             ** CONFLUENCE DATA **
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                     Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                             NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                      43.07 52.25 0.869 0.83(0.47) 0.56 82.8 20500.00
                                                                              1
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     105.44 28.34 1.255 0.86(0.47) 0.55 148.9 20510.00
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             CONFLUENCE FORMULA USED FOR 2 STREAMS.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99
                                                                             ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 105.30
                                                                             STREAM
                                                                                     Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
   ***STREET FLOWING FULL***
                                                                             NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                              1 148.51 28.34 1.255 0.85(0.47) 0.55 193.8 20510.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     96.85 52.25 0.869 0.85(0.47) 0.55 231.7 20500.00
   STREET FLOW DEPTH (FEET) = 0.79
   HALFSTREET FLOOD WIDTH (FEET) = 32.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.13
                                                                             COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             PEAK FLOW RATE (CFS) = 148.51 Tc (MIN.) = 28.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.05
 STREET FLOW TRAVEL TIME (MIN.) = 4.36 Tc (MIN.) = 28.34
                                                                             EFFECTIVE AREA(ACRES) = 193.83 AREA-AVERAGED Fm(INCH/HR) = 0.47
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.255
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.85 AREA-AVERAGED Ap = 0.55
 SUBAREA LOSS RATE DATA(AMC II):
                                                                             TOTAL AREA (ACRES) = 231.7
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                             LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20518.00 = 7021.32 FEET.
                                                    SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           ******************
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 37.81 0.98
                                              0.600 32
                                                                             FLOW PROCESS FROM NODE 20518.00 TO NODE 20519.00 IS CODE = 33
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.14 0.75 0.600 56
                                                                             >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.95
                                                                             >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           _____
 SUBAREA AREA(ACRES) = 41.95
                             SUBAREA RUNOFF(CFS) = 25.79
                                                                             UPSTREAM NODE ELEVATION (FEET) = 1489.50
 EFFECTIVE AREA(ACRES) = 148.93 AREA-AVERAGED Fm(INCH/HR) = 0.47
                                                                             DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
 AREA-AVERAGED Fp(INCH/HR) = 0.86 AREA-AVERAGED Ap = 0.55
                                                                             FLOW LENGTH (FEET) = 2632.61 MANNING'S N = 0.013
 TOTAL AREA(ACRES) = 148.9 PEAK FLOW RATE(CFS) = 105.44
                                                                             USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             DEPTH OF FLOW IN 60.0 INCH PIPE IS 27.0 INCHES
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
                                                                             PIPE-FLOW VELOCITY (FEET/SEC.) = 17.35
                                                                             PIPE-FLOW(CFS) = 148.51
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                             *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.28
                                                                             PIPEFLOW TRAVEL TIME (MIN.) = 2.69 Tc (MIN.) = 31.03
 FLOW VELOCITY (FEET/SEC.) = 5.11 DEPTH*VELOCITY (FT*FT/SEC.) = 4.05
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.188
 LONGEST FLOWPATH FROM NODE 20510.00 TO NODE 20518.00 = 5604.37 FEET.
                                                                             SUBAREA LOSS RATE DATA(AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 FLOW PROCESS FROM NODE 20518.00 TO NODE 20518.00 IS CODE = 1
                                                                             SCHOOL
                                                                                                A 21.65 0.98 0.600 32
______
                                                                             RESIDENTIAL
                                                                             "3-4 DWELLINGS/ACRE" A 27.03 0.98
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                                                        0.600
                                                                                                A 8.46 0.98 0.250 32
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
                                                                             MOBILE HOME PARK
                                                                             SCHOOL
                                                                                                        7.51 0.75 0.600 56
 TOTAL NUMBER OF STREAMS = 2
                                                                             RESIDENTIAL
```

Date: 04/21/2014

File name: LR0205ZZ.RES

Page 18

```
"3-4 DWELLINGS/ACRE"
                        В
                              5.29
                                        0.75
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
                                                0.600
                 В
                                2.31
                                         0.75
                                               0.250
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
 MOBILE HOME PARK
                                                                                                                         Fρ
                                                                                                                                  Αp
                                                                                                                                         SCS
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548
                                                                                  RESIDENTIAL
 SUBAREA AREA (ACRES) = 72.25 SUBAREA RUNOFF (CFS) = 44.23
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                                13.85
                                                                                                                          0.98
                                                                                                                                 0.600
                                                                                                       A
                                                                                                                16.29
 EFFECTIVE AREA(ACRES) = 266.08 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                                  SCHOOL
                                                                                                                         0.98
                                                                                                                                 0.600
                                                                                                                                         32
 AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.55
                                                                                  RESIDENTIAL
                                                                                                             15.89
                                                                                                                          0.75
                                                                                                                                 0.600
 TOTAL AREA (ACRES) = 304.0
                                PEAK FLOW RATE (CFS) = 169.97
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                         В
                                                                                                         В
                                                                                                                         0.75
                                                                                                                                 0.850
                                                                                  PUBLIC PARK
                                                                                                               9.87
                                                                                                                                         56
                                                                                                                                 0.600
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                                         В
                                                                                                               12.11
                                                                                                                         0.75
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.84
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.636
 STREET CROSS-SECTION INFORMATION:
                                                                                  SUBAREA AREA(ACRES) = 68.01
                                                                                                               SUBAREA RUNOFF (CFS) = 37.85
                                                                                  EFFECTIVE AREA(ACRES) = 334.09 AREA-AVERAGED Fm(INCH/HR) = 0.49
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.57
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  TOTAL AREA (ACRES) = 372.0 PEAK FLOW RATE (CFS) = 199.79
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  STREET CROSS-SECTION INFORMATION:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  CURB HEIGHT (INCHES) = 8.0
                                                                                                             STREET HALFWIDTH (FEET) = 26.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 21.46
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   STREET FLOW DEPTH(FEET) = 0.50
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   HALFSTREET FLOOD WIDTH (FEET) = 16.89
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.53
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 ** PEAK FLOW RATE TABLE **
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                               Ae HEADWATER
  STREAM
            0
                 Tc Intensity Fp(Fm)
                                                                                  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 29.82
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                (ACRES) NODE
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    1
          169.97 31.03 1.188 0.87(0.48) 0.55
                                                266.1 20510.00
                                                                                   STREET FLOW DEPTH (FEET) = 0.54
    2
          103.37 55.25 0.841 0.87(0.48) 0.55
                                                304.0 20500.00
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 19.17
 NEW PEAK FLOW DATA ARE:
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.86
 PEAK FLOW RATE (CFS) = 169.97 Tc (MIN.) = 31.03
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.09
 AREA-AVERAGED Fm(INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.87
 AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 266.08
                                                                                  ** PEAK FLOW RATE TABLE **
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20519.00 = 9653.93 FEET.
                                                                                            Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                                        HEADWATER
                                                                                            (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                                 (ACRES) NODE
******************
                                                                                           199.79 32.55 1.155 0.87(0.49) 0.57 334.1 20510.00
                                                                                   1
                                                                                           119.84 56.99 0.825 0.86(0.49) 0.57 372.0 20500.00
 FLOW PROCESS FROM NODE 20519.00 TO NODE 20520.00 IS CODE = 33
                                                                                     2
                                                                                  NEW PEAK FLOW DATA ARE:
                                                                                  PEAK FLOW RATE (CFS) = 199.79 Tc (MIN.) = 32.55
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                  AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.87
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
                                                                                  AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 334.09
                                                                                  LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20520.00 = 11206.45 FEET.
 UPSTREAM NODE ELEVATION (FEET) = 1440.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1410.00
                                                                                ******************
 FLOW LENGTH (FEET) = 1552.52 MANNING'S N = 0.013
                                                                                  FLOW PROCESS FROM NODE 20520.00 TO NODE 20536.00 IS CODE = 33
 USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
                                                                                ______
 DEPTH OF FLOW IN 66.0 INCH PIPE IS 27.5 INCHES
                                                                                  >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.10
                                                                                 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 PIPE-FLOW(CFS) = 169.97
                                                                                _____
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                  UPSTREAM NODE ELEVATION (FEET) = 1410.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.52 Tc (MIN.) = 32.55
                                                                                  DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.155
                                                                                  FLOW LENGTH (FEET) = 1041.51 MANNING'S N = 0.013
```

Date: 04/21/2014

File name: LR020577.RFS

Page 20

Date: 04/21/2014

File name: LR020577.RFS

```
USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 31.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.90
 PIPE-FLOW(CFS) = 199.79
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 33.64
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.132
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 3.22
                                         0.98 0.600
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.36 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 5.58
                               SUBAREA RUNOFF(CFS) = 3.04
 EFFECTIVE AREA(ACRES) = 339.67 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.87 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) = 377.5 PEAK FLOW RATE (CFS) = 199.79
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET.
*****************
 FLOW PROCESS FROM NODE 20536.00 TO NODE 20536.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 33.64
 RAINFALL INTENSITY (INCH/HR) = 1.13
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.87
 AREA-AVERAGED Ap = 0.57
 EFFECTIVE STREAM AREA(ACRES) = 339.67
 TOTAL STREAM AREA(ACRES) = 377.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 199.79
```

```
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 818.88
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1470.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.549
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.872
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                       Fр
                                                      SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 5.33 0.98 0.600
                                                      32 14.55
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 6.17
 TOTAL AREA(ACRES) = 5.33 PEAK FLOW RATE(CFS) =
                                                   6.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
******************
 FLOW PROCESS FROM NODE 20531.00 TO NODE 20532.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1470.00 DOWNSTREAM ELEVATION(FEET) = 1465.00
 STREET LENGTH (FEET) = 771.13 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               15.29
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.18
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.08
 STREET FLOW TRAVEL TIME (MIN.) = 5.88 Tc (MIN.) = 20.43
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.527
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                      SCS
                                                αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A
                              21.08
                                        0.98
                                               0.600
```

FLOW PROCESS FROM NODE 20530.00 TO NODE 20531.00 IS CODE = 21

Date: 04/21/2014 File name: LR0205ZZ.RES Page 21

Date: 04/21/2014 File name: LR0205ZZ.RES

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.08 SUBAREA RUNOFF(CFS) = 17.87
 EFFECTIVE AREA(ACRES) = 26.41 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 26.4 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.21
 FLOW VELOCITY (FEET/SEC.) = 2.51 DEPTH*VELOCITY (FT*FT/SEC.) = 1.37
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 771.1 FT WITH ELEVATION-DROP = 5.0 FT, IS 22.3 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20532.00
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20532.00 = 1590.01 FEET.
*****************
 FLOW PROCESS FROM NODE 20532.00 TO NODE 20533.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1465.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1455.00
 FLOW LENGTH (FEET) = 1024.14 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 33.0 INCH PIPE IS 15.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.46
 PIPE-FLOW(CFS) =
                 22.38
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.02 Tc (MIN.) = 22.45
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20533.00 = 2614.15 FEET.
FLOW PROCESS FROM NODE 20533.00 TO NODE 20533.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 22.45
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.443
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                         Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 SCHOOL
                     A 1.18 0.98 0.600 32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.68 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 2.86 SUBAREA RUNOFF(CFS) = 2.21
 EFFECTIVE AREA(ACRES) = 29.27 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 22.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
```

```
FLOW PROCESS FROM NODE 20533.00 TO NODE 20534.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1455.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
STREET LENGTH (FEET) = 1374.03 CURB HEIGHT (INCHES) = 6.0
STREET HALFWIDTH (FEET) = 18.00
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.53
 HALFSTREET FLOOD WIDTH (FEET) = 19.54
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.11
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.18
STREET FLOW TRAVEL TIME (MIN.) = 5.58 Tc (MIN.) = 28.03
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.263
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" A 3.88 0.98 0.600 32
SCHOOL
                      A 34.43 0.98 0.600 32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA(ACRES) = 38.31 SUBAREA RUNOFF(CFS) = 23.38
EFFECTIVE AREA(ACRES) = 67.58 AREA-AVERAGED Fm(INCH/HR) = 0.59
AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
TOTAL AREA (ACRES) = 67.6 PEAK FLOW RATE (CFS) =
                                                            41.24
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.88
FLOW VELOCITY (FEET/SEC.) = 4.36 DEPTH*VELOCITY (FT*FT/SEC.) = 2.43
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 24.0 INCH PIPE IS 16.3 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 9.96
PIPE-FLOW(CFS) = 22.60
PIPEFLOW TRAVEL TIME (MIN.) = 2.30 Tc (MIN.) = 24.75
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.361
SUBAREA AREA (ACRES) = 38.31 SUBAREA RUNOFF (CFS) = 26.75
TOTAL AREA (ACRES) = 67.6 PEAK FLOW RATE (CFS) = 47.19
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Date: 04/21/2014 File name: LR0205ZZ.RES Page 23

Date: 04/21/2014 File name: LR0205ZZ.RES

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 24.59
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.60
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.76
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20534.00 = 3988.18 FEET.
******************
 FLOW PROCESS FROM NODE 20534.00 TO NODE 20535.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1396.00
 STREET LENGTH (FEET) = 1929.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.63
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.91
 STREET FLOW TRAVEL TIME (MIN.) = 6.76 Tc (MIN.) = 31.51
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.177
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
      LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 35.20 0.98 0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 35.20 SUBAREA RUNOFF(CFS) = 18.77
 EFFECTIVE AREA(ACRES) = 102.78 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

Date: 04/21/2014

```
DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.32
 FLOW VELOCITY (FEET/SEC.) = 4.72 DEPTH*VELOCITY (FT*FT/SEC.) = 2.86
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 8.80
 PIPE-FLOW(CFS) =
                    27.68
 PIPEFLOW TRAVEL TIME (MIN.) = 3.65 Tc (MIN.) = 28.40
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.253
 SUBAREA AREA(ACRES) = 35.20
                            SUBAREA RUNOFF (CFS) = 21.16
 TOTAL AREA(ACRES) = 102.8
                                PEAK FLOW RATE (CFS) = 61.79
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 34.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.53
   HALFSTREET FLOOD WIDTH (FEET) = 19.60
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.05
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.16
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20535.00 = 5917.68 FEET.
*******************
 FLOW PROCESS FROM NODE 20535.00 TO NODE 20536.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1396.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1395.00
 FLOW LENGTH (FEET) = 1300.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 37.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 4.21
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 5.48 Tc (MIN.) = 33.89
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.127
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 12.27 0.98 0.600
                                                        32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 12.67 SUBAREA RUNOFF (CFS) = 6.23
 EFFECTIVE AREA(ACRES) = 115.45 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 115.4
                                PEAK FLOW RATE (CFS) =
                                                          61.79
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
```

File name: LR0205ZZ.RES Page 25 Date: 04/21/2014 File name: LR0205ZZ.RES Page 26

```
STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 26.00
                                                                                >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               ______
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1395.00
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1394.50
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                FLOW LENGTH (FEET) = 877.02 MANNING'S N = 0.013
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 144.00 NUMBER OF PIPES = 1
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                DEPTH OF FLOW IN 144.0 INCH PIPE IS 64.0 INCHES
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 5.39
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
                                                                                PIPE-FLOW(CFS) = 261.58
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
       STREET HYDRAULICS NOT COMPUTED*
 LONGEST FLOWPATH FROM NODE 20530.00 TO NODE 20536.00 = 7218.31 FEET.
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 2.88 Tc (MIN.) = 36.52
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.078
*******************
                                                                                SUBAREA LOSS RATE DATA(AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
 FLOW PROCESS FROM NODE 20536.00 TO NODE 20536.00 IS CODE = 1
                                                                                  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                RESIDENTIAL
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
                                                                                "3-4 DWELLINGS/ACRE" B 13.40 0.75 0.600
                                                                                                     B 8.54 0.75 0.600 56
_____
 TOTAL NUMBER OF STREAMS = 2
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TIME OF CONCENTRATION (MIN.) = 33.89
                                                                                SUBAREA AREA (ACRES) = 21.94 SUBAREA RUNOFF (CFS) = 12.42
                                                                                EFFECTIVE AREA(ACRES) = 476.21 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RAINFALL INTENSITY (INCH/HR) = 1.13
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.58
 AREA-AVERAGED Fm(INCH/HR) = 0.58
 AREA-AVERAGED Fp (INCH/HR) = 0.97
                                                                                TOTAL AREA (ACRES) = 514.9 PEAK FLOW RATE (CFS) = 261.58
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 115.45
 TOTAL STREAM AREA(ACRES) = 115.45
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 61.79
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
 ** CONFLUENCE DATA **
                                                                                STREET CROSS-SECTION INFORMATION:
  STREAM
          0
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
    1
          199.79 33.64 1.132 0.87(0.49) 0.57 339.7 20510.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
    1
       119.92 58.24 0.814 0.86(0.49) 0.57 377.5 20500.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
          61.79 33.89 1.127 0.97(0.58) 0.60 115.4 20530.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                      STREET HYDRAULICS NOT COMPUTED*
    1
          261.58 33.64 1.132 0.89(0.51) 0.58 454.3 20510.00
                                                                                LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20537.00 = 13124.98 FEET.
    2
          260.77 33.89 1.127 0.89(0.51) 0.58 455.5 20530.00
                                                                               157.02 58.24 0.814 0.89(0.51) 0.57 493.0 20500.00
    3
                                                                                FLOW PROCESS FROM NODE 20537.00 TO NODE 20538.00 IS CODE = 48
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 261.58 Tc (MIN.) = 33.64
                                                                                >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 EFFECTIVE AREA(ACRES) = 454.27 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 AREA-AVERAGED Fp(INCH/HR) = 0.89 AREA-AVERAGED Ap = 0.58
                                                                               ______
 TOTAL AREA(ACRES) = 493.0
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 1394.00 DOWNSTREAM(FEET) = 1380.00
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20536.00 = 12247.96 FEET.
                                                                                FLOW LENGTH (FEET) = 851.83 MANNING'S N = 0.014
                                                                                GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 4.00
```

Page 27

File name: LR0205ZZ.RES

Date: 04/21/2014

Date: 04/21/2014 File name: LR0205ZZ.RES Page 28

FLOWDEPTH IN BOX IS 2.58 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.92

FLOW PROCESS FROM NODE 20536.00 TO NODE 20537.00 IS CODE = 33

56

```
BOX-FLOW(CFS) = 261.58
 BOX-FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 37.36
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20538.00 = 13976.81 FEET.
*******************
 FLOW PROCESS FROM NODE 20538.00 TO NODE 20538.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 37.36
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.063
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fр
                                                   SCS
                                             Ар
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                                             0.500
                    В
                             6.57
                                      0.75
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             9.02
                                      0.75
                                             0.600
                                                   56
                      В
 COMMERCIAL
                       В
                             6.87
                                      0.75
                                             0.100
 PUBLIC PARK
                      В
                             0.38
                                      0.75
                                             0.850
                                                    56
 SCHOOL
                       В
                             0.45
                                      0.75
                                             0.600
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.428
 SUBAREA AREA (ACRES) = 23.29
                             SUBAREA RUNOFF (CFS) = 15.57
 EFFECTIVE AREA(ACRES) = 499.50 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) =
                   538.2
                              PEAK FLOW RATE(CFS) =
                                                   261 58
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
********************
 FLOW PROCESS FROM NODE 20538.00 TO NODE 20539.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1366.00
 FLOW LENGTH (FEET) = 1281.91 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 7.00 GIVEN BOX HEIGHT(FEET) = 4.00
 FLOWDEPTH IN BOX IS 2.58 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 14.46
 BOX-FLOW(CFS) = 261.58
 BOX-FLOW TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 38.83
 LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 38.83
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.039
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                   SCS
                                             αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                             0.02
                                      0.75
                                             0.600 56
```

```
3.73 0.75 0.100
 COMMERCIAL
                  В
                                           56
                        1.42
 PUBLIC PARK
                  В
                               0.75 0.850
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.308
 SUBAREA AREA(ACRES) = 5.17
                        SUBAREA RUNOFF (CFS) = 3.76
 EFFECTIVE AREA(ACRES) = 504.67 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.88 AREA-AVERAGED Ap = 0.57
 TOTAL AREA (ACRES) =
               543.4
                         PEAK FLOW RATE (CFS) =
                                          261.58
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90
******************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
______
*****************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20454.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2044.74 Tc (MIN.) = 54.02
 AREA-AVERAGED Fm (INCH/HR) = 0.55 Ybar = 0.62
 TOTAL AREA (ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
*****************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2044.74 Tc (MIN.) = 54.02
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.62
 TOTAL AREA (ACRES) = 5435.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20454.00 = 33620.61 FEET.
******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20454.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
______
******************
 FLOW PROCESS FROM NODE 20454.00 TO NODE 20539.00 IS CODE = 54
   _____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
-----
 ELEVATION DATA: UPSTREAM(FEET) = 1395.00 DOWNSTREAM(FEET) = 1366.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1483.64 CHANNEL SLOPE = 0.0195
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
```

Date: 04/21/2014 File name: LR0205ZZ.RES

Page 30

```
==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
    CAPACITY ( NORMAL DEPTH EOUAL TO SPECIFIED MAXIMUM
   ALLOWABLE DEPTH).
   AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
   ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.
```

```
*GIVEN HEIGHT (FEET) = 1.00 ESTIMATED CHANNEL BASE (FEET) = 147.16
CHANNEL FLOW THRU SUBAREA(CFS) = 2044.74
FLOW VELOCITY (FEET/SEC.) = 13.71 FLOW DEPTH (FEET) = 1.00
TRAVEL TIME (MIN.) = 0.17 Tc (MIN.) = 54.19
LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

\_\_\_\_\_

MAINLINE Tc(MIN.) = 54.19

\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.850 SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Аp	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
PUBLIC PARK	В	2.13	0.75	0.850	56
SCHOOL	В	8.75	0.75	0.600	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В	3.67	0.75	0.600	56
COMMERCIAL	В	0.11	0.75	0.100	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	В	0.07	0.75	0.500	56
MOBILE HOME PARK	В	4.39	0.75	0.250	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.544

SUBAREA AREA(ACRES) = 19.12

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.47;6H= 2.14;24H= 4.49 S-GRAPH: VALLEY(DEV.) = 50.2%; VALLEY(UNDEV.) / DESERT = 49.8%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.55; Ybar = 0.62

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;

3HR = 0.96; 6HR = 0.98; 24HR = 0.99

UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5454.9

LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0326; Lca/L=0.4,n=.0292; Lca/L=0.5,n=.0269; Lca/L=0.6,n=.0251

TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 803.57

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2011.22

TOTAL AREA (ACRES) = 5454.9 PEAK FLOW RATE (CFS) = 2044.74

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 11

File name: LR0205ZZ.RES Page 31 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<

\*\* MAIN STREAM CONFLUENCE DATA \*\* PEAK FLOW RATE (CFS) = 2044.74 Tc (MIN.) = 54.19

AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.62

TOTAL AREA (ACRES) = 5454.9

LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 261.58 38.70 1.041 0.88(0.50) 0.57 504.7 20510.00 260.77 38.83 1.039 0.88(0.50) 0.57 505.9 20530.00 163.41 63.80 0.771 0.88(0.50) 0.57 543.4 20500.00

LONGEST FLOWPATH FROM NODE 20500.00 TO NODE 20539.00 = 15258.72 FEET.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.46;6H= 2.12;24H= 4.44

S-GRAPH: VALLEY (DEV.) = 54.6%; VALLEY (UNDEV.) / DESERT= 45.4%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.55; Ybar = 0.62

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.76; 30M = 0.76; 1HR = 0.76;

3HR = 0.96; 6HR = 0.98; 24HR = 0.99

UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 5998.3

LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0326; Lca/L=0.4,n=.0292; Lca/L=0.5,n=.0269; Lca/L=0.6,n=.0251

TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 879.89

PEAK FLOW RATE (CFS) = 2190.53

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12 .....

>>>>CLEAR MEMORY BANK # 1 <<<<<

\_\_\_\_\_

\*

FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 152

>>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<

PEAK FLOWRATE TABLE FILE NAME: 20539.DNA

\_\_\_\_\_

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 5998.3 TC (MIN.) = 54.19

AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.62

PEAK FLOW RATE (CFS) = 2190.53

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 Page 32 File name: LR020577.RFS

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20454

- TO NODE 20454

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0206ZZ.DAT

TIME/DATE OF STUDY: 07:57 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

USER SPECIFIED HIDROLOGI AND HIDRAULIC MODEL INFORMATION.

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING	
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR	
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====	=======	=======================================	=====	=====	=====	=====	======	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

		10.0	0.020/0.	020/0.020	0.50	1.50	0.0312	0.125	0.0180
18	26.0	15.0	0.020/0. 0.020/0.	020/0.020	0.67	2.00	0.0312	0.167	0.0180
19	52.0	20.0	0.020/0.	020/0.020	0.67	2.00	0.0312	0.167	0.0180
GLC  *SI OF *US  UNI V I I I I	DBAL STRE 1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T SER-SPECI IT-HYDROG WATERSHEI USED "VAI 1 UNITS/F FOR DEVEI PRECIPITA SIERRA MA	EET FLOW- LVE Flow- aximum Al a) * (Veloc WITH A F CO THE UP IFIED MIN GRAPH MOD D LAG = 0 LLEY UNDE ACRE AND LOPMENTS ATION DAT ADRE DEPT	DEPTH CONS Depth = 0 lowable St ity) Const LOW CAPACI STREAM TRI IMUM TOPOG EL SELECTI	TRAINTS: .20 FEET reet Flow raint = 6 TY GREATER BUTARY PIP RAPHIC SLO ONS/PARAME -GRAPH FOR "VALLEY DE /ACRE AND ON SUBAREA TORS USED.	Depth)0 (FT*F THAN E.* PE ADJUS TERS: DEVELOP VELOPED" MORE. BASIS.	(Top- T/S) TMENT : MENTS : S-GRA	of-Curb) NOT SELE OF PH	CTED	
5	SIERRA MA	ADRE DEPT	H-AREA FAC	TORS USED.					
						FOR UN	IT HYDRO	GRAPH	METHO
				(/					
****	******	*****	*****	*****	*****	*****	*****	*****	****
FLO	OW PROCES	SS FROM N	ODE 20600	.00 TO NOD	E 20601	.00 IS	CODE =	21	
>>>	>>>RATION	NAL METHO	D INITIAL	SUBAREA AN	ALYSIS<<	:<<<			
							AREA<<		
J<<	JSE TIME-	-OF-CONCE	NTRATION N	OMOGRAPH F	OR INITI	AL SUB			
J<<	USE TIME-	-OF-CONCE	NTRATION N	OMOGRAPH F	OR INITI	AL SUB		=====	=====
)<< 	USE TIME- ====== ITIAL SUE	OF-CONCE	NTRATION N ====== W-LENGTH(F	OMOGRAPH F ======= EET) = 6	OR INITI ====== 67.14	AL SUB	======		
)<< 	USE TIME- ====== ITIAL SUE	OF-CONCE	NTRATION N	OMOGRAPH F ======= EET) = 6	OR INITI ====== 67.14	AL SUB	======		
>>U ===== INI ELE	USE TIME- ====== ITIAL SUE EVATION I	-OF-CONCE BAREA FLO DATA: UPS	NTRATION N ======= W-LENGTH(F TREAM(FEET	OMOGRAPH F ======= EET) = 6 ) = 2277	OR INITI ====== 67.14 .00 DOW	AL SUB	======		
>>U ===== INI ELE TC	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3	NTRATION N ===================================	OMOGRAPH F ======= EET) = 6 ) = 2277 ATION CHAN	OR INITI ======= 67.14 .00 DOW GE)]**0.	AL SUB ====== NSTREA	======		
>>U INI ELE TC SUE	USE TIME- ======= ITIAL SUE EVATION I = K*[(LE BAREA ANA	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3	NTRATION N ===================================	OMOGRAPH F ======== EET) = 6 ) = 2277 ATION CHAN TC(MIN.)	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0	AL SUB.  INSTREAL  20 86	======		
>>U	USE TIME-  ITIAL SUE  EVATION I  K*[(LE  BAREA ANA  10 YEAR	OF-CONCE	NTRATION N ======== W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR)	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  INSTREAL  20 86	======		
>>U	USE TIME-  ITIAL SUE  EVATION I  K*[(LE  BAREA ANA  10 YEAR  BAREA TC	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS	NTRATION N ======== W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II):	OR INITI ==================================	AL SUB ===== INSTREA 20 86	======: M(FEET) :	= 21	75.00
>>U	USE TIME-  ITIAL SUE EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA	OR INITI ======== 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  INSTREAL 20 86	======: M(FEET) : Ap	= 21 SCS	75.00 Tc
>>U ===== INJ ELE TC SUE * SUE	USE TIME-  ITIAL SUE EVATION I  K [ (LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U	-OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS WT TYPE/ JSE	NTRATION N ======== W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA	OR INITI ======== 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  INSTREAL 20 86	======: M(FEET) : Ap	= 21 SCS	75.00 Tc
>>U ===== INJ ELE TC SUE * SUE DE	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE  BAREA ANA 10 YEAR  BAREA TC  EVELOPMEN  LAND U  SIDENTIAI	OF-CONCE	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	OMOGRAPH F =======  EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH	AL SUB INSTREAT 20 86	M(FEET) : Ap	= 21 SCS ) CN	75.00 Tc (MIN.
>>U ===== INJ ELE TC SUE * SUE DE	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE  BAREA ANA 10 YEAR  BAREA TC  EVELOPMEN  LAND U  SIDENTIAI	OF-CONCE	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH	AL SUB INSTREAT 20 86	M(FEET) : Ap	= 21 SCS ) CN	75.00 Tc (MIN.
>>U ===== INJ ELF Tc SUF * SUF DF RES "3- RES	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND (LE SIDENTIAL  4 DWELLI SIDENTIAL	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU " B	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 0.5	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.	Ap (DECIMAL 0.600	= 21 SCS ) CN 56	75.00 Tc (MIN.
>>U ===== INJ ELF Tc SUF * SUF DF RES "3- RES	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND (LE SIDENTIAL  4 DWELLI SIDENTIAL	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 0.5	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.	Ap (DECIMAL 0.600	= 21 SCS ) CN 56	75.00 Tc (MIN.
>>U ===== INI ELF TC SUF * SUF DF RES "3- RES	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND (LE SIDENTIAL  4 DWELLI SIDENTIAL	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU " B	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 0.5	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.	Ap (DECIMAL 0.600	= 21 SCS ) CN 56	75.00 Tc (MIN.
>>U INJ ELE TC SUE * SUE DE RES "3- RES	USE TIME-  ITIAL SUE EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND U SIDENTIAI -4 DWELLI SIDENTIAI DWELLING	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS WI TYPE/ JSE LNGS/ACRE GS/ACRE" ER COVER	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU " B	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES 0.5	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  NSTREA  20 86  //HR)  .75	Ap (DECIMAL 0.600 0.700	= 21 SCS ) CN 56	75.00 Tc (MIN. 8.0
>>U INI ELE Tc SUE * SUE DE RES "3- RES "2 NAT	USE TIME-  ========  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND I  SIDENTIAL  SIDENTIAL  DWELLING  FURAL FAI  PEN BRUSH	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU "B B B	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2	OR INITI ======== 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  NSTREA  20 86  //HR)  .75  .75	Ap (DECIMAL 0.600 0.700 1.000	= 21 SCS ) CN 56	75.00 Tc (MIN. 8.0
>>U INITIAL IN	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND U SIDENTIAL SIDENTIAL DWELLLI DWELLI TURAL FAI PEN BRUSE BAREA AVE	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS WI TYPE/ JSE LINGS/ACRE ES/ACRE ER COVER H" ERAGE PER	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU "B B B VIOUS LOSS	OMOGRAPH F =======  EET) = 6 ) = 2277  ATION CHAN    Tc (MIN.)    (INCH/HR)    (AMC II):    OIL AREA P (ACRES	OR INITI ======== 67.14 .00 DOW GE)]**0. = 8.0 = 2.663     Fp ) (INCH 6 0 0 0 INCH/HR)	AL SUB.  NSTREA  20 86  .//HR)  .75  .61 = 0.	Ap (DECIMAL 0.600 0.700 1.000 74	= 21 SCS ) CN 56	Tc (MIN. 8.0
>>U INITIAL IN	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND U SIDENTIAL SIDENTIAL DWELLI SIDENTIAL DWELLI TURAL FAI PEN BRUSE BAREA AVE BAREA AVE	OF-CONCE BAREA FLO DATA: UPS CNGTH** 3 ALYSIS US RAINFALL AND LOSS WI TYPE/ JSE LINGS/ACRE ES/ACRE" ER COVER H" ERAGE PER ERAGE PER	NTRATION N ======== W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU "B B VIOUS LOSS VIOUS AREA	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2  0.3 RATE, Fp( FRACTION,	OR INITI ======== 67.14 .00 DOW GE)]**0. = 8.0 = 2.663     Fp ) (INCH 6 0 0 0 INCH/HR)	AL SUB.  NSTREA  20 86  .//HR)  .75  .61 = 0.	Ap (DECIMAL 0.600 0.700 1.000 74	= 21 SCS ) CN 56	75.00 Tc (MIN. 8.0
>>U INN ELE TC SUE * SUE DE RESS "3- RESS "2 NAT "OF SUE SUE SUE SUE SUE SUE SUE	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND U  SIDENTIAL  DWELLING  TURAL FAI  PEN BRUSH  BAREA AVE  BAREA RUN  BAREA RUN	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU " B B VIOUS LOSS VIOUS AREA = 11.	OMOGRAPH F =======  EET) = 6 ) = 2277  ATION CHAN    Tc (MIN.)    (INCH/HR)    (AMC II):    OIL AREA P (ACRES	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH 6 0 0 0 INCH/HR) Ap = 0	AL SUB.  NSTREA  20 86  (/HR)  .75  .75  .61  = 0706	Ap (DECIMAL 0.600 0.700 1.000 74	SCS ) CN 56 56 66	75.00 Tc (MIN. 8.0
>>U INN ELE TC SUE * SUE DE RESS "3- RESS "2 NAT "OF SUE SUE SUE SUE SUE SUE SUE	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND U  SIDENTIAL  DWELLING  TURAL FAI  PEN BRUSH  BAREA AVE  BAREA RUN  BAREA RUN	-OF-CONCE 	NTRATION N ======== W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU "B B VIOUS LOSS VIOUS AREA	OMOGRAPH F =======  EET) = 6 ) = 2277  ATION CHAN    Tc (MIN.)    (INCH/HR)    (AMC II):    OIL AREA    P (ACRES	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH 6 0 0 0 INCH/HR) Ap = 0	AL SUB.  NSTREA  20 86  (/HR)  .75  .75  .61  = 0706	Ap (DECIMAL 0.600 0.700 1.000 74	SCS ) CN 56 56 66	75.00 Tc (MIN. 8.0
>>I INI ELF IN	USE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND U  SIDENTIAL  JUELLING  TURAL FAI  PEN BRUSH  BAREA AVE  BAREA RUN  TAL AREA	-OF-CONCE 	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU " B B VIOUS LOSS VIOUS AREA = 11. 6.12	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN TC (MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2 0.3 RATE, Fp( FRACTION, 80 PEAK FL	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH 6 0 0 0 INCH/HR) Ap = 0 OW RATE(	AL SUB.  NSTREA  20 86  (/HR)  .75  .75  .61  = 0706	Ap (DECIMAL 0.600 0.700 1.000 74	SCS ) CN 56 56 66	75.00 Tc (MIN. 8.0
>>(IN) ELF TC SUE * SUE DE RESS "3- RESS "22 "20 SUE	JSE TIME-  ITIAL SUE EVATION I  BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAI	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS NT TYPE/ USE ENGS/ACRE ENGS/ACRE ER COVER I" ERAGE PER ERAG	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU B B VIOUS LOSS VIOUS AREA = 11. 6.12	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2 0.3 RATE, Fp( FRACTION, 80 PEAK FL	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH 6 0 0 0 INCH/HR) Ap = 0 OW RATE( CH):	AL SUB.  NSTREA  20 86  (HR)  .75  .75  .61  = 0706  CFS) =	Ap (DECIMAL 0.600 0.700 1.000 74	SCS ) CN 56 56 66	Tc (MIN. 8.0 8.6 13.8
>>(IN) ELF TC SUE * SUE DE RESS "3- RESS "22 "20 SUE	JSE TIME-  ITIAL SUE EVATION I  BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAI	OF-CONCE BAREA FLO DATA: UPS ENGTH** 3 ALYSIS US RAINFALL AND LOSS NT TYPE/ USE ENGS/ACRE ENGS/ACRE ER COVER I" ERAGE PER ERAG	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV. ED MINIMUM INTENSITY RATE DATA SCS S GROU " B B VIOUS LOSS VIOUS AREA = 11. 6.12	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2 0.3 RATE, Fp( FRACTION, 80 PEAK FL	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663 Fp ) (INCH 6 0 0 0 INCH/HR) Ap = 0 OW RATE( CH):	AL SUB.  NSTREA  20 86  (HR)  .75  .75  .61  = 0706  CFS) =	Ap (DECIMAL 0.600 0.700 1.000 74	SCS ) CN 56 56 66	Tc (MIN. 8.0 8.6 13.8
>>None of the content of the c	USE TIME- ======= ITIAL SUE EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND ( SIDENTIAL -4 DWELLING FURAL FAI DWELLING FURAL FAI PEN BRUSH BAREA AVE BAREA RUN TAL AREA ( BAREA ARE = 0.30;	OF-CONCE BAREA FLO DATA: UPS BAREA FLO DATA: UPS BAILYSIS US RAINFALL AND LOSS UT TYPE/ JSE BASS/ACRE BASS/ACRE BERGE PER ROOFF (CFS) (ACRES) = CA-AVERAG 30M = 0.	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B VIOUS LOSS VIOUS AREA = 11. 6.12 ED RAINFAL 61; 1HR =	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2  0.3 RATE, FP( FRACTION, 80 PEAK FL L DEPTH(IN 0.80; 3HR	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  INSTREA  20 86  I/HR)  .75  .61  = 0706  CFS) =  6HR =	Ap (DECIMAL 0.600 0.700 1.000 74 11.4	SCS ) CN 56 56 66	75.00  TC (MIN. 8.0 8.6 13.8
>>VICTOR SUPPLY NATIONS OF SUPPLY NATIONS	JSE TIME-  =======  ITIAL SUE  EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC  EVELOPMEN LAND ( SIDENTIAL -4 DWELLING FURAL FAI PEN BRUSH BAREA AVE BAREA RUN TAL AREA ( BAREA ARE = 0.30;	OF-CONCE BAREA FLO DATA: UPS BAREA FLO DATA: UPS BAILYSIS US RAINFALL AND LOSS INT TYPE/ JSE BASS/ACRE BASS/ACRE BERGE PER ROOFF (CFS) (ACRES) = CA-AVERAG 30M = 0.	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B VIOUS LOSS VIOUS AREA = 11. 6.12 ED RAINFAL 61; 1HR =	OMOGRAPH F ======= EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2  0.3 RATE, FP( FRACTION, 80 PEAK FL L DEPTH(IN 0.80; 3HR	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB.  INSTREA  20 86  I/HR)  .75  .61  = 0706  CFS) =  6HR =  ******	Ap (DECIMAL 0.600 0.700 1.000 74 11.4	SCS) CN 56 56 66 80 HR = 4	75.00  Tc (MIN. 8.0 8.6 13.8
>>\text{INJ} ELF  TC SUE * SUE DF  RESS "3- RESS "2 NATION SUE SUE SUE SUE SUE FLC *******	USE TIME- ======= ITIAL SUE EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND U SIDENTIAL -4 DWELLING TURAL FAI PEN BRUSH BAREA AVE BA	OF-CONCE BAREA FLO DATA: UPS BAREA FLO DATA: UPS BAREA FLO DATA: UPS BALYSIS US RAINFALL AND LOSS UTSE BASS/ACRE BASS/ACRE BASS/BASS/BASS/BASS/BASS/BASS/BASS/BASS	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B VIOUS LOSS VIOUS AREA = 11. 6.12 ED RAINFAL 61; 1HR = *********** ODE 20601	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2  0.3 RATE, Fp( FRACTION, 80 PEAK FL L DEPTH(IN 0.80; 3HR  ***********************************	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB. ====== NSTREA 20 86 //HR) .75 .75 .61 = 0706 CFS) = 6HR = ******	Ap (DECIMAL 0.600 0.700 1.000 74 11.	SCS ) CN 56 66 66 80 HR = 4 *****	Tc (MIN. 8.0 8.6 13.8
>>\text{INJ} ELF  TC SUE * SUE DF  RESS "3- RESS "2 NATION SUE SUE SUE SUE SUE FLC *******	USE TIME- ======= ITIAL SUE EVATION I  = K*[(LE BAREA ANA 10 YEAR BAREA TC LAND U SIDENTIAL -4 DWELLING TURAL FAI PEN BRUSH BAREA AVE BA	OF-CONCE BAREA FLO DATA: UPS BAREA FLO DATA: UPS BAREA FLO DATA: UPS BALYSIS US RAINFALL AND LOSS UTSE BASS/ACRE BASS/ACRE BASS/BASS/BASS/BASS/BASS/BASS/BASS/BASS	NTRATION N ======= W-LENGTH(F TREAM(FEET .00)/(ELEV ED MINIMUM INTENSITY RATE DATA SCS S GROU B B VIOUS LOSS VIOUS AREA = 11. 6.12 ED RAINFAL 61; 1HR =	OMOGRAPH F ======== EET) = 6 ) = 2277  ATION CHAN Tc(MIN.) (INCH/HR) (AMC II): OIL AREA P (ACRES  0.5 5.2  0.3 RATE, Fp( FRACTION, 80 PEAK FL L DEPTH(IN 0.80; 3HR  ***********************************	OR INITI ======= 67.14 .00 DOW GE)]**0. = 8.0 = 2.663	AL SUB. ====== NSTREA 20 86 //HR) .75 .75 .61 = 0706 CFS) = 6HR = ******	Ap (DECIMAL 0.600 0.700 1.000 74 11.	SCS ) CN 56 66 66 80 HR = 4 *****	Tc (MIN. 8.0 8.6 13.8

ELEVATION DATA: UPSTREAM(FEET) = 2175.00 DOWNSTREAM(FEET) = 2160.00

Date: 04/21/2014 File name: LR0206ZZ.RES Page 1 Date: 04/21/2014 File name: LR0206ZZ.RES Page 2

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 204.73 CHANNEL SLOPE = 0.0733
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             11.80
 FLOW VELOCITY (FEET/SEC.) = 3.45 FLOW DEPTH (FEET) = 0.48
 TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 9.08
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20602.00 = 871.87 FEET.
FLOW PROCESS FROM NODE 20602.00 TO NODE 20602.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 9.08
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.485
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                             Aр
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                             0.68
                                     0.75
                                             0.700
                                                  56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.18
                                     0.75
                                             0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
 SUBAREA AREA(ACRES) = 0.86
                            SUBAREA RUNOFF (CFS) = 1.54
 EFFECTIVE AREA(ACRES) = 6.98 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 7.0 PEAK FLOW RATE (CFS) =
                                                    12.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
********************
 FLOW PROCESS FROM NODE 20602.00 TO NODE 20603.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2145.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.43 CHANNEL SLOPE = 0.0559
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             12.36
 FLOW VELOCITY (FEET/SEC.) = 3.12 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 10.51
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20603.00 = 1140.30 FEET.
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20603.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 10.51
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.275
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                   B 1.70 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 1.70 SUBAREA RUNOFF (CFS) = 2.68
 EFFECTIVE AREA(ACRES) = 8.68 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 8.7 PEAK FLOW RATE (CFS) = 13.72
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
******************
 FLOW PROCESS FROM NODE 20603.00 TO NODE 20604.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2145.00 DOWNSTREAM(FEET) = 2135.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 214.72 CHANNEL SLOPE = 0.0466
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 13.72
 FLOW VELOCITY (FEET/SEC.) = 3.00 FLOW DEPTH (FEET) = 0.55
 TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 11.70
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20604.00 = 1355.02 FEET.
************************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20604.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 11.70
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.133
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                         Ар
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 1.97
                                    0.75
                                          0.700
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.08
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA(ACRES) = 2.05 SUBAREA RUNOFF(CFS) = 2.97
 EFFECTIVE AREA(ACRES) = 10.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 10.7 PEAK FLOW RATE(CFS) =
                                                 15.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
*******************
 FLOW PROCESS FROM NODE 20604.00 TO NODE 20605.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 2135.00 DOWNSTREAM(FEET) = 2125.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 174.03 CHANNEL SLOPE = 0.0575
```

Date: 04/21/2014 File name: LR020677.RFS

Page 4

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            15.58
 FLOW VELOCITY (FEET/SEC.) = 3.38 FLOW DEPTH (FEET) = 0.55
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 12.56
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20605.00 = 1529.05 FEET.
******************
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20605.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 12.56
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.044
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Ар
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 2.05
                                    0.75
                                           0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.10
                                    0.75
                                         0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA AREA(ACRES) = 2.15
                         SUBAREA RUNOFF (CFS) = 2.95
 EFFECTIVE AREA(ACRES) = 12.88 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.9
                           PEAK FLOW RATE(CFS) =
                                                 17.68
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
*****
 FLOW PROCESS FROM NODE 20605.00 TO NODE 20606.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2115.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 235.99 CHANNEL SLOPE = 0.0424
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            17.68
 FLOW VELOCITY (FEET/SEC.) = 3.11 FLOW DEPTH (FEET) = 0.62
 TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 13.82
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20606.00 = 1765.04 FEET.
******************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20606.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 13.82
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.930
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                           αA
                                                 SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                            3.11
                                    0.75
                                           0.700 56
```

```
"3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.693
 SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) = 4.23
 EFFECTIVE AREA(ACRES) = 16.21 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.2
                              PEAK FLOW RATE(CFS) =
                                                    20.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
***********************
 FLOW PROCESS FROM NODE 20606.00 TO NODE 20607.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 2115.00 DOWNSTREAM(FEET) = 2092.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 277.39 CHANNEL SLOPE = 0.0829
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             20.59
 FLOW VELOCITY (FEET/SEC.) = 4.15 FLOW DEPTH (FEET) = 0.58
 TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 14.94
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20607.00 = 2042.43 FEET.
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20607.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.94
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.843
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             αA
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 0.41
                                     0.75
                                            0.700
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.659
 SUBAREA AREA(ACRES) = 0.70
                             SUBAREA RUNOFF(CFS) = 0.85
 EFFECTIVE AREA(ACRES) = 16.91 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 16.9
                              PEAK FLOW RATE(CFS) =
                                                    20.59
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
******************
 FLOW PROCESS FROM NODE 20607.00 TO NODE 20608.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 6

RESIDENTIAL

```
ELEVATION DATA: UPSTREAM(FEET) = 2092.00 DOWNSTREAM(FEET) = 2080.00
                                                                                                  В 5.77
                                                                                                                 0.75
                                                                                                                        0.100
                                                                            COMMERCIAL
                                                                                                                                56
 CHANNEL LENGTH THRU SUBAREA (FEET) = 203.75 CHANNEL SLOPE = 0.0589
                                                                            RESIDENTIAL
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  B 7.52
                                                                                                                 0.75
                                                                                                                        0.700
                                                                                                                                56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                            RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.91
                                                                                                                 0.75
                                                                                                                        0.600
                               20.59
                                                                                                  В
                                                                                                         1.23
 FLOW VELOCITY (FEET/SEC.) = 3.65 FLOW DEPTH (FEET) = 0.61
                                                                            MOBILE HOME PARK
                                                                                                                 0.75
                                                                                                                        0.250
 TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 15.87
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE" B 0.92
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20608.00 = 2246.18 FEET.
                                                                                                                 0.75 0.900
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
*************
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.460
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20608.00 IS CODE = 81
                                                                            SUBAREA AREA (ACRES) = 16.35 SUBAREA RUNOFF (CFS) = 19.47
                                                                            EFFECTIVE AREA(ACRES) = 38.51 AREA-AVERAGED Fm(INCH/HR) = 0.44
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
_____
                                                                            TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) =
                                                                                                                                42.52
 MAINLINE Tc(MIN.) = 15.87
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.777
 SUBAREA LOSS RATE DATA(AMC II):
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                             Аp
                                   Fр
                                                    SCS
                                                                           ******************
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                            FLOW PROCESS FROM NODE 20609.00 TO NODE 20610.00 IS CODE = 63
 "2 DWELLINGS/ACRE"
                    В
                            2.94
                                      0.75
                                             0.700
                                                   56
 RESIDENTIAL
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 "3-4 DWELLINGS/ACRE" B
                            2.31 0.75
                                            0.600 56
                                                                            >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.656
                                                                            UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
 SUBAREA AREA (ACRES) = 5.25 SUBAREA RUNOFF (CFS) = 6.08
                                                                            STREET LENGTH (FEET) = 360.92 CURB HEIGHT (INCHES) = 6.0
 EFFECTIVE AREA(ACRES) = 22.16 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                            STREET HALFWIDTH (FEET) = 18.00
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 22.2 PEAK FLOW RATE(CFS) = 25.24
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
*****************
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 FLOW PROCESS FROM NODE 20608.00 TO NODE 20609.00 IS CODE = 54
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
______
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ELEVATION DATA: UPSTREAM(FEET) = 2080.00 DOWNSTREAM(FEET) = 2065.00
                                                                             ***STREET FLOWING FULL***
 CHANNEL LENGTH THRU SUBAREA (FEET) = 358.70 CHANNEL SLOPE = 0.0418
                                                                             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                             STREET FLOW DEPTH (FEET) = 0.60
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                             HALFSTREET FLOOD WIDTH (FEET) = 22.83
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              25.24
                                                                             AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.11
 FLOW VELOCITY (FEET/SEC.) = 3.37 FLOW DEPTH (FEET) = 0.71
                                                                             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.45
 TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 17.64
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 19.11
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20609.00 = 2604.88 FEET.
                                                                            * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.590
                                                                            SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fp
                                                                                                                         Αр
 FLOW PROCESS FROM NODE 20609.00 TO NODE 20609.00 IS CODE = 81
                                                                               LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            RESIDENTIAL
                                                                            "5-7 DWELLINGS/ACRE"
                                                                                               В 1.29
                                                                                                                 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                                                        0.500
                                                                                                                                56
______
                                                                            COMMERCIAL
                                                                                                в 2.79
                                                                                                                 0.75
                                                                                                                        0.100
                                                                                                                                56
 MAINLINE Tc(MIN.) = 17.64
                                                                            RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.667
                                                                            "3-4 DWELLINGS/ACRE"
                                                                                               В
                                                                                                        0.24
                                                                                                                 0.75
                                                                                                                        0.600
                                                                                                                                56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                           Ар
                                                    SCS
                                                                            "2 DWELLINGS/ACRE"
                                                                                                  В
                                                                                                         0.95
                                                                                                                 0.75
                                                                                                                        0.700
                                                                                                                                56
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            MOBILE HOME PARK
                                                                                                  В
                                                                                                         0.22
                                                                                                                 0.75
                                                                                                                        0.250
       Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                  Date: 04/21/2014 File name: LR0206ZZ.RES
                                                                                                                              Page 8
```

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 SUBAREA AREA(ACRES) = 5.49 SUBAREA RUNOFF(CFS) = 6.65
 EFFECTIVE AREA(ACRES) = 44.00 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 44.0 PEAK FLOW RATE (CFS) =
                                                           46.47
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.96
 FLOW VELOCITY (FEET/SEC.) = 4.12 DEPTH*VELOCITY (FT*FT/SEC.) = 2.47
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20610.00 = 2965.80 FEET.
*****************
 FLOW PROCESS FROM NODE 20610.00 TO NODE 20611.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2057.00
 STREET LENGTH (FEET) = 352.55 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.46
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 20.72
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.514
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     в 0.30
                                                  0.500
                                                        56
                                          0.75
                                1.71
 COMMERCIAL
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B
                                1.66
                                          0.75
                                                  0.400
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                               1.04
                                          0.75
                                                  0.600
                                                        56
 RESIDENTIAL
                       В
                               12.96
                                          0.75
                                                  0.700
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
```

File name: LR0206ZZ.RES

Page 9

Date: 04/21/2014

```
EFFECTIVE AREA (ACRES) = 61.67 AREA-AVERAGED Fm (INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.57
 TOTAL AREA(ACRES) = 61.7
                                 PEAK FLOW RATE(CFS) =
                                                           60.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.70 HALFSTREET FLOOD WIDTH (FEET) = 27.84
 FLOW VELOCITY (FEET/SEC.) = 3.72 DEPTH*VELOCITY (FT*FT/SEC.) = 2.59
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 352.5 FT WITH ELEVATION-DROP = 3.0 FT, IS 34.7 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20611.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20611.00 = 3318.35 FEET.
******************
 FLOW PROCESS FROM NODE 20611.00 TO NODE 20612.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2057.00 DOWNSTREAM ELEVATION(FEET) = 2054.00
 STREET LENGTH (FEET) = 398.28 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     80 43
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 31.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.82
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.97
 STREET FLOW TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 22.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.443
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                 αA
                                                          SCS
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                       B 0.48
                                          0.75
                                                  0.500
                                                          56
 COMMERCIAL
                         B 2.00
                                          0.75
                                                  0.100
                                                          56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                         в 37.07
                                          0.75
                                                  0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                         В
                                 6.98
                                          0.75
                                                  0.600
                                                          56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                         B
                                 0.01
                                          0.75
                                                  0.400
                                                          56
 NATURAL FAIR COVER
       Date: 04/21/2014
                         File name: LR0206ZZ.RES
                                                        Page 10
```

SUBAREA AREA (ACRES) = 17.67 SUBAREA RUNOFF (CFS) = 16.89

```
"OPEN BRUSH"
                       В
                              0.36 0.61 1.000 66
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
                                                                                  SUBAREA AREA(ACRES) = 4.37 SUBAREA RUNOFF(CFS) = 4.32
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.660
                                                                                  EFFECTIVE AREA(ACRES) = 112.94 AREA-AVERAGED Fm(INCH/HR) = 0.45
 SUBAREA AREA (ACRES) = 46.90 SUBAREA RUNOFF (CFS) = 40.11
 EFFECTIVE AREA(ACRES) = 108.57 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
                                                                                  TOTAL AREA (ACRES) = 112.9 PEAK FLOW RATE (CFS) =
                                                                                                                                           96.51
 TOTAL AREA (ACRES) = 108.6 PEAK FLOW RATE (CFS) = 96.51
                                                                                  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.38: 6HR = 1.95: 24HR = 4.02
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 34.25
                                                                                  DEPTH (FEET) = 0.78 HALFSTREET FLOOD WIDTH (FEET) = 31.81
 FLOW VELOCITY (FEET/SEC.) = 3.99 DEPTH*VELOCITY (FT*FT/SEC.) = 3.29
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.60 DEPTH*VELOCITY (FT*FT/SEC.) = 3.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
                                                                                  LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20613.00 = 4083.00 FEET.
       AND L = 398.3 FT WITH ELEVATION-DROP = 3.0 FT, IS 85.6 CFS,
                                                                                ******************
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20612.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20612.00 = 3716.63 FEET.
                                                                                  FLOW PROCESS FROM NODE 20613.00 TO NODE 20614.00 IS CODE = 63
*******************
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20612.00 TO NODE 20613.00 IS CODE = 63
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                _____
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  UPSTREAM ELEVATION(FEET) = 2050.00 DOWNSTREAM ELEVATION(FEET) = 2047.00
                                                                                  STREET LENGTH(FEET) = 389.73 CURB HEIGHT(INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 2054.00 DOWNSTREAM ELEVATION(FEET) = 2050.00
 STREET LENGTH (FEET) = 366.37 CURB HEIGHT (INCHES) = 6.0
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     99.13
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 98.67
                                                                                    STREET FLOW DEPTH (FEET) = 0.83
   ***STREET FLOWING FULL***
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 34.43
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.06
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.36
   STREET FLOW DEPTH(FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 32.11
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 25.38
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.62
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.340
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.61
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 1.32 Tc (MIN.) = 23.78
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fp
                                                                                                                                 αA
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.394
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
                                                                                  "5-7 DWELLINGS/ACRE"
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                                       B 0.63
                                                                                                                          0.75
                                                                                                                                  0.500
                                                                                                                                          56
                                        Fρ
                                                 αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  COMMERCIAL
                                                                                                         B 2.36
                                                                                                                          0.75
                                                                                                                                  0.100
                                                                                                                                          56
                                                                                  RESIDENTIAL
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     В
                                0.53
                                         0.75
                                                 0.500
                                                       56
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                         B 0.24
                                                                                                                          0.75
                                                                                                                                  0.600
                                                                                                                                          56
 COMMERCIAL
                                2.00
                                         0.75
                                                 0.100
                                                       56
                        В
                                                                                  RESIDENTIAL
 RESIDENTIAL
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                         В
                                                                                                               2.47
                                                                                                                          0.75 0.700
 "2 DWELLINGS/ACRE"
                                1.58
                                         0.75
                                                 0.700
                                                        56
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.425
 "3-4 DWELLINGS/ACRE"
                                0.26
                                         0.75
                                                 0.600
                                                                                  SUBAREA AREA(ACRES) = 5.70
                                                                                                                SUBAREA RUNOFF(CFS) = 5.24
```

Date: 04/21/2014

File name: LR0206ZZ.RES

Page 12

Date: 04/21/2014

File name: LR0206ZZ.RES

```
EFFECTIVE AREA(ACRES) = 118.64 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 118.6 PEAK FLOW RATE (CFS) = 96.51
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 32.90
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.31 DEPTH*VELOCITY (FT*FT/SEC.) = 3.44
                                                                                 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20615.00 = 4797.39 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               ************************
 DEPTH (FEET) = 0.82 HALFSTREET FLOOD WIDTH (FEET) = 34.06
 FLOW VELOCITY(FEET/SEC.) = 4.03 DEPTH*VELOCITY(FT*FT/SEC.) = 3.31
                                                                                 FLOW PROCESS FROM NODE 20615.00 TO NODE 20616.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20614.00 = 4472.73 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20614.00 TO NODE 20615.00 IS CODE = 63
                                                                               _____
______
                                                                                 UPSTREAM ELEVATION(FEET) = 2044.00 DOWNSTREAM ELEVATION(FEET) = 2042.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET LENGTH (FEET) = 320.06 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
UPSTREAM ELEVATION (FEET) = 2047.00 DOWNSTREAM ELEVATION (FEET) = 2044.00
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 324.66 CURB HEIGHT (INCHES) = 6.0
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 36.14
   ***STREET FLOWING FULL***
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.76
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.25
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 28.05
   STREET FLOW DEPTH(FEET) = 0.80
   HALFSTREET FLOOD WIDTH (FEET) = 33.21
                                                                                 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.263
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.34
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.49
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
                                                                                                                                       SCS
 STREET FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 26.63
                                                                                     LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.302
                                                                                 RESIDENTIAL
                                                                                 "5-7 DWELLINGS/ACRE" B 2.51 0.75
                                                                                                                                0.500
                                                                                                                                        56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                     B 0.24
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                                                 COMMERCIAL
                                                                                                                        0.75
                                                                                                                                0.100
                                                                                                                                        56
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 2.23
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                                                        56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.61
                                        0.75
                                                0.500 56
                                                                                 RESIDENTIAL.
                                                                                                      в 7.57 0.75 0.700
                      В 1.87
                                        0.75
                                                0.100 56
                                                                                 "2 DWELLINGS/ACRE"
 COMMERCIAL
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.40
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.631
                                        0.75
                                                0.600
 RESIDENTIAL
                                                                                 SUBAREA AREA (ACRES) = 12.55 SUBAREA RUNOFF (CFS) = 8.93
 "2 DWELLINGS/ACRE" B 2.63
                                        0.75
                                              0.700 56
                                                                                 EFFECTIVE AREA(ACRES) = 136.70 AREA-AVERAGED Fm(INCH/HR) = 0.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.467
                                                                                 TOTAL AREA (ACRES) = 136.7 PEAK FLOW RATE (CFS) = 101.03
 SUBAREA AREA (ACRES) = 5.51 SUBAREA RUNOFF (CFS) = 4.73
 EFFECTIVE AREA (ACRES) = 124.15 AREA-AVERAGED Fm (INCH/HR) = 0.44
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 TOTAL AREA (ACRES) = 124.1 PEAK FLOW RATE (CFS) = 96.56
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 13 Date: 04/21/2014 File name: LR0206ZZ.RES Page 14

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.86 HALFSTREET FLOOD WIDTH(FEET) = 36.14
 FLOW VELOCITY (FEET/SEC.) = 3.76 DEPTH*VELOCITY (FT*FT/SEC.) = 3.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 320.1 FT WITH ELEVATION-DROP = 2.0 FT, IS 24.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20616.00
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20616.00 = 5117.45 FEET.
********************
 FLOW PROCESS FROM NODE 20616.00 TO NODE 20648.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2042.00 DOWNSTREAM ELEVATION(FEET) = 2025.00
 STREET LENGTH (FEET) = 522.92 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 104.08
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.67
   HALFSTREET FLOOD WIDTH (FEET) = 26.50
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.04
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.72
 STREET FLOW TRAVEL TIME (MIN.) = 1.24 Tc (MIN.) = 29.28
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.230
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                      SCS SOIL AREA
                                         Fρ
                                                  αA
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                               2.43
                                         0.75
                                                 0.500
                                                       56
                        В
                        В
                                2.02
 COMMERCIAL
                                         0.75
                                                 0.100
                                                         56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                                3.04
                         В
                                         0.75
                                                 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В 0.27
                                         0.75
                                                 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.478
 SUBAREA AREA(ACRES) = 7.76 SUBAREA RUNOFF(CFS) = 6.10
 EFFECTIVE AREA (ACRES) = 144.46 AREA-AVERAGED Fm (INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 144.5 PEAK FLOW RATE (CFS) = 103.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.43
 FLOW VELOCITY (FEET/SEC.) = 7.01 DEPTH*VELOCITY (FT*FT/SEC.) = 4.69
 LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5640.37 FEET.
*******************
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
*****************
 FLOW PROCESS FROM NODE 20620.00 TO NODE 20621.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 866.66
 ELEVATION DATA: UPSTREAM(FEET) = 2190.00 DOWNSTREAM(FEET) = 2160.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.083
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.093
 SUBAREA TC AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                          Αp
                                               SCS Tc
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
                   В 11.35
                                  0.61 1.000
                                                66 20.71
 "OPEN BRUSH"
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89 0.75 0.600
                                               56 12.08
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.971
 SUBAREA RUNOFF (CFS) = 16.42
 TOTAL AREA (ACRES) = 12.24 PEAK FLOW RATE (CFS) = 16.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
FLOW PROCESS FROM NODE 20621.00 TO NODE 20622.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2160.00 DOWNSTREAM(FEET) = 2150.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 356.13 CHANNEL SLOPE = 0.0281
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 16.42
 FLOW VELOCITY (FEET/SEC.) = 2.12 FLOW DEPTH (FEET) = 0.47
 TRAVEL TIME (MIN.) = 2.80 Tc (MIN.) = 14.88
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20622.00 = 1222.79 FEET.
******************
 FLOW PROCESS FROM NODE 20622.00 TO NODE 20622.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 14.88
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 16

SUBAREA LOSS RATE DATA	(AMC II):	ADEA	En	7) +0	000
DEVELOPMENT TYPE/ LAND USE	SCS SUIL	AKEA	fp	Ap	SUS
NATURAL FAIR COVER	GROUP	(ACKES)	(INCH/HK)	(DECIMAL)	CN
	D	2 72	0.61	1 000	66
"OPEN BRUSH" RESIDENTIAL	В	3./3	0.01	1.000	00
RESIDENTIAL	D.	1 57	0.75	0 700	Г.С
"2 DWELLINGS/ACRE"	В	1.5/	0.75	0.700	56
RESIDENTIAL	_	1 60	0.75	0 600	F.C.
"3-4 DWELLINGS/ACRE"					56
SUBAREA AVERAGE PERVIO				.66	
SUBAREA AVERAGE PERVIO					
SUBAREA AREA(ACRES) =					
EFFECTIVE AREA(ACRES)					= 0.58
AREA-AVERAGED Fp(INCH/	HR) = 0.63	3 AREA-A'	VERAGED Ap	= 0.92	
TOTAL AREA (ACRES) =	19.2	PEAK	FLOW RATE (	CFS) =	21.76
SUBAREA AREA-AVERAGED	RAINFALL DE	EPTH (INCH	):		
5M = 0.30; 30M = 0.61;	1HR = 0.80	); 3HR =	1.38; 6HR =	1.95; 24H	R = 4.02
******	******	******	*****	*****	*******
FLOW PROCESS FROM NODE	20622.00	TO NODE	20623.00 I	S CODE =	54
>>>>COMPUTE TRAPEZOID	AL CHANNEL	FLOW<<<	<		
>>>>TRAVELTIME THRU S	UBAREA (EXI	ISTING EL	EMENT) <<<<		
CHANNEL BASE (FEET) =	0.00 "2	Z" FACTOR	= 35.000	EL SLOPE =	0.0313
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) =	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N	Z" FACTOR JM DEPTH( 21. 5 FLOW MIN.) =	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00	.00 = 0.51	
	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620	Z" FACTOR JM DEPTH() 21. 5 FLOW: MIN.) = 0.00 TO No.	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.	.00 = 0.51 00 = 13	81.29 FEET.
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620 **********************************	Z" FACTOR JM DEPTH( 21. 5 FLOW MIN.) = 0.00 TO No ************* TO NODE	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623. ************************************	.00 = 0.51 00 = 133 *********************************	81.29 FEET.
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ************************************	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620 ************************************	Z" FACTOR JM DEPTH( 21. 5 FLOW MIN.) = 0.00 TO N ******** TO NODE LINE PEAK	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  *********** 20623.00 I	.00 = 0.51 00 = 133 **********************************	81.29 FEET. ************
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ************************************	45 MAXIMUREA (CFS) = 2.35 1.12 Tc (NODE 20620 **********************************	Z" FACTOR JM DEPTH( 21. 5 FLOW MIN.) = 0.00 TO N ******** TO NODE LINE PEAK	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  *********** 20623.00 I	.00 = 0.51 00 = 133 **********************************	81.29 FEET. ************
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ************************************	45 MAXIMU REA(CFS) = 2.35 1.12 Tc(NODE 20620  *********** 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW 4IN.) = 0.00 TO NO ********* TO NODE LINE PEAK	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  *********** 20623.00 I	.00 = 0.51 00 = 133 **********************************	81.29 FEET. ************ 81
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  *************************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) =  * 10 YEAR RAINFALL IN	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW 4IN.) = 0.00 TO NO ******** TO NODE LINE PEAK CH/HR) =	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  *********** 20623.00 I	.00 = 0.51 00 = 133 ***********************************	81.29 FEET. ************ 81
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK CH/HR) =	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********* 20623.00 I	.00 = 0.51 00 = 13: ************ S CODE = :	81.29 FEET. *********** 81
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK CH/HR) =	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********* 20623.00 I	.00 = 0.51 00 = 13: ************ S CODE = :	81.29 FEET. *********** 81
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************** FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) = * 10 YEAR RAINFALL IN SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK CH/HR) =	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********* 20623.00 I	.00 = 0.51 00 = 13: ************ S CODE = :	81.29 FEET. *********** 81
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ****************** ***** ******** ****	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51 00 = 133 ********** S CODE = 33 	81.29 FEET. ********** 81  SCS CN
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ****************** FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) = * 10 YEAR RAINFALL IN SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE"	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51 00 = 133 ********** S CODE = 33 	81.29 FEET. ********** 81  SCS CN
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK ====================================	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51 00 = 133 ************ S CODE = 33 	81.29 FEET.  *********** 81  SCS CN 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 6 FLOW : 70 NO TO NO ******** TO NODE LINE PEAK ====================================	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51 00 = 133 ************ S CODE = 33 	81.29 FEET. ********** 81  SCS CN
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ***************** *FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW 4IN.) = 0.00 TO N ******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 3.20 0.56	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********** 20623.00 I FLOW<<<<< 1.768 Fp (INCH/HR) 0.75 0.61	.00 = 0.51 00 = 13: ************************************	81.29 FEET.  ************ 81 SCS CN 56 66
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  **************** *FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********* 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW 4IN.) = 0.00 TO N ******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 3.20 0.56	= 35.000 FEET) = 1 76 DEPTH(FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51 00 = 13: ************************************	81.29 FEET.  ************ 81 SCS CN 56 66
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ***************** FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) = * 10 YEAR RAINFALL IN SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" NATURAL FAIR COVER "OPEN BRUSH" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE"	45 MAXIMU REA(CFS) = 2.35 1.12 Tc(N NODE 20620  **********  20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW: 4IN.) = 0.00 TO NO ******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 3.20 0.56 1.58	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51	81.29 FEET.  ************ 81  SCS CN  56 66 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ***************** FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBAR  MAINLINE TC (MIN.) = * 10 YEAR RAINFALL IN SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" NATURAL FAIR COVER "OPEN BRUSH" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE"	45 MAXIMU REA(CFS) = 2.35 1.12 Tc(N NODE 20620  **********  20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW: 4IN.) = 0.00 TO NO ******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 3.20 0.56 1.58	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********** 20623.00 I FLOW<<<<< 1.768 Fp (INCH/HR) 0.75 0.61	.00 = 0.51	81.29 FEET.  ************ 81  SCS CN  56 66 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ********************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBAR  MAINLINE TC(MIN.) = * 10 YEAR RAINFALL IN SUBAREA LOSS RATE DATA DEVELOPMENT TYPE/ LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" NATURAL FAIR COVER "OPEN BRUSH" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "8-10 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE" RESIDENTIAL "3-4 DWELLINGS/ACRE"	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH( 21. 5 FLOW 4IN.) = 0.00 TO NO ******** TO NODE LINE PEAK AREA (ACRES) 3.20 0.56 1.58 2.74	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********** 20623.00 I	.00 = 0.51  00 = 138  ********  S CODE = 38	81.29 FEET.  *********** 81  SCS CN 56 66 56 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************** ************ ****	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ************ 20623.00  EA TO MAINI ===================================	Z" FACTOR JM DEPTH( 21. 5 FLOW 4IN.) = 0.00 TO NO ******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 3.20 0.56 1.58 2.74 0.08	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********* 20623.00 I	.00 = 0.51 00 = 138 ******** S CODE = 38	81.29 FEET.  ************ 81  SCS CN 56 66 56 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY(FEET/SEC TRAVEL TIME(MIN.) = LONGEST FLOWPATH FROM  ******************* ************ *****	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 41N.) = 0.00 TO NO ******** *** ****** *** *** *** *** *	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********* 20623.00 I	.00 = 0.51 00 = 138 ******** S CODE = 38	81.29 FEET.  ************ 81  SCS CN 56 66 56 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************** FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 41N.) = 0.00 TO NO ******** ******* ****** ****** ***** ****	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********* 20623.00 I FLOW<<<< 1.768 Fp (INCH/HR) 0.75 0.61 0.75 0.75 CH/HR) = 0 p = 0.631	.00 = 0.51 00 = 133 ***********************************	81.29 FEET.  ************ 81   SCS CN 56 66 56 56 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 41N.) = 0.00 TO NO ******** ******* ****** ****** ***** ****	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********* 20623.00 I FLOW<<<< 1.768 Fp (INCH/HR) 0.75 0.61 0.75 0.75 CH/HR) = 0 p = 0.631	.00 = 0.51 00 = 133 ***********************************	81.29 FEET.  ************ 81   SCS CN 56 66 56 56 56
MANNING'S FACTOR = 0.0 CHANNEL FLOW THRU SUBA FLOW VELOCITY (FEET/SEC TRAVEL TIME (MIN.) = LONGEST FLOWPATH FROM  ******************* FLOW PROCESS FROM NODE	45 MAXIMU REA(CFS) = .) = 2.35 1.12 Tc(N NODE 20620  ********** 20623.00	Z" FACTOR JM DEPTH() 21. 5 FLOW : 41N.) = 0.00 TO NO ******** ******* ****** ****** ***** ****	= 35.000 FEET) = 1 76 DEPTH (FEET) 16.00 ODE 20623.  ********* 20623.00 I FLOW<<<< 1.768 Fp (INCH/HR) 0.75 0.61 0.75 0.75 CH/HR) = 0 p = 0.631	.00 = 0.51 00 = 133 ***********************************	81.29 FEET.  *********** 81   SCS CN  56  66  56  56  56

```
AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) =
                                                29.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
*************************
 FLOW PROCESS FROM NODE 20623.00 TO NODE 20624.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 2145.00 DOWNSTREAM(FEET) = 2140.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 251.47 CHANNEL SLOPE = 0.0199
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              29.98
 FLOW VELOCITY (FEET/SEC.) = 2.16 FLOW DEPTH (FEET) = 0.63
 TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 17.95
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20624.00 = 1632.76 FEET.
******************
 FLOW PROCESS FROM NODE 20624.00 TO NODE 20624.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 17.95
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.650
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                  SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 4.38 0.75 0.400 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.30
                                    0.75 0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    в 1.08
                                  0.75 0.900 56
 CONDOMINIUMS
                            0.14
                                    0.75 0.350
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.546
 SUBAREA AREA (ACRES) = 10.90 SUBAREA RUNOFF (CFS) = 12.18
 EFFECTIVE AREA(ACRES) = 38.22 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.75
                              PEAK FLOW RATE (CFS) = 39.28
 TOTAL AREA (ACRES) = 38.2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
******************
 FLOW PROCESS FROM NODE 20624.00 TO NODE 20625.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2140.00 DOWNSTREAM(FEET) = 2130.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 332.21 CHANNEL SLOPE = 0.0301
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 35.000
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 18

EFFECTIVE AREA(ACRES) = 27.32 AREA-AVERAGED Fm(INCH/HR) = 0.55

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.502
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 2.69 FLOW DEPTH (FEET) = 0.65
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
 TRAVEL TIME (MIN.) = 2.06 Tc (MIN.) = 20.00
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20625.00 = 1964.97 FEET.
                                                                                RESIDENTIAL
                                                                                "8-10 DWELLINGS/ACRE"
                                                                                                    в 0.09
                                                                                                                      0.75
                                                                                                                              0.400
*******************
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 4.68
                                                                                                                       0.75
                                                                                                                              0.600
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20625.00 IS CODE = 81
                                                                                                    В
                                                                                                              0.24
                                                                                                                              0.250
                                                                                MOBILE HOME PARK
                                                                                                                       0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                                RESIDENTIAL
______
                                                                                                    B 0.04 0.75 0.900
                                                                                ".4 DWELLING/ACRE"
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MAINLINE Tc (MIN.) = 20.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.546
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582
                                                                                SUBAREA AREA (ACRES) = 5.05 SUBAREA RUNOFF (CFS) = 4.85
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                                                EFFECTIVE AREA(ACRES) = 48.90 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.72
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                TOTAL AREA (ACRES) = 48.9 PEAK FLOW RATE (CFS) = 44.39
 "3-4 DWELLINGS/ACRE" B 5.47
                                    0.75
                                             0.600
                                                     56
 RESIDENTIAL
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 "8-10 DWELLINGS/ACRE" B 0.16 0.75 0.400 56
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.56
 SUBAREA AREA(ACRES) = 5.63 SUBAREA RUNOFF(CFS) = 5.58
 EFFECTIVE AREA(ACRES) = 43.85 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.82 DEPTH*VELOCITY (FT*FT/SEC.) = 2.98
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
                                                                                LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20626.00 = 2307.32 FEET.
 TOTAL AREA(ACRES) = 43.9 PEAK FLOW RATE(CFS) = 41.28
                                                                              ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 20626.00 TO NODE 20627.00 IS CODE = 63
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
******************
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW PROCESS FROM NODE 20625.00 TO NODE 20626.00 IS CODE = 63
                                                                              ______
                                                                                UPSTREAM ELEVATION(FEET) = 2116.00 DOWNSTREAM ELEVATION(FEET) = 2110.00
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                STREET LENGTH (FEET) = 424.67 CURB HEIGHT (INCHES) = 6.0
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                STREET HALFWIDTH (FEET) = 18.00
_____
 UPSTREAM ELEVATION(FEET) = 2130.00 DOWNSTREAM ELEVATION(FEET) = 2116.00
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET LENGTH (FEET) = 342.35 CURB HEIGHT (INCHES) = 6.0
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 ***STREET FLOWING FULL***
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 STREET FLOW DEPTH(FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 43.71
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 22.77
   ***STREET FLOWING FULL***
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.15
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
   STREET FLOW DEPTH (FEET) = 0.51
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 22.70
   HALFSTREET FLOOD WIDTH (FEET) = 18.50
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.434
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.77
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.94
                                                                                DEVELOPMENT TYPE/
                                                                                                  SCS SOIL AREA
                                                                                                                      Fρ
                                                                                                                              Aр
 STREET FLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 20.99
                                                                                    LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Page 19

Date: 04/21/2014

File name: LR0206ZZ.RES

Date: 04/21/2014 File name: LR0206ZZ.RES Page 20

56

56

56

SCS

RESIDENTIAL	-	0.00	0.75	0 400	F.C.	".4 DWELLING/ACRE"	В	2.66	0.75	0.900	56
"8-10 DWELLINGS/ACRE"	В	0.03	0.75	0.400	56	RESIDENTIAL		1 65	0.75	0 600	F.C.
RESIDENTIAL	D	0 50	0.75	0 600	F.C	"3-4 DWELLINGS/ACRE" COMMERCIAL	В	1.65	0.75	0.600	56 56
"3-4 DWELLINGS/ACRE"	В	2.50	0.75	0.600	56	SUBAREA AVERAGE PERVIOU			0.75	0.100	36
RESIDENTIAL ".4 DWELLING/ACRE"	D	1.53	0.75	0.900	56	SUBAREA AVERAGE PERVIOU				. / 3	
MOBILE HOME PARK	D D	0.07	0.75	0.250	56	SUBAREA AREA(ACRES) =				c) – 1	6.1
COMMERCIAL		0.07	0.75	0.230	56	EFFECTIVE AREA(ACRES) =					
SUBAREA AVERAGE PERVIOUS					30	AREA-AVERAGED Fp (INCH/					- 0.49
SUBAREA AVERAGE PERVIOUS		-		. 75		TOTAL AREA (ACRES) =					44.85
SUBAREA AREA(ACRES) =				2) - 3	/I Q	NOTE: PEAK FLOW RATE DE				(CFS) -	44.00
EFFECTIVE AREA(ACRES) =			,	,		NOIE. TEAR PHOW RATE DE	EFRODIED TO	OLDINEAM	VALOE		
AREA-AVERAGED Fp (INCH/HR)					- 0.30	SUBAREA AREA-AVERAGED E	PATMEATT DET	оти (тмси) •			
TOTAL AREA (ACRES) =					44 85	5M = 0.30; 30M = 0.61;				1 95 24	IR = 4 02
TOTAL TRUM (MOREO)	55.1	I IIIII I	DOM IMITE	(010)	11.00	3H 0.30, 30H 0.01,	11111 0.00,	, 2111¢ 1.	30, OIIIC	1.55, 241	11. 1.02
SUBAREA AREA-AVERAGED RA	TNFALL DEPT	TH (TNCH) ·				END OF SUBAREA STREET H	FT.OW HYDRAIII	TCS.			
5M = 0.30; 30M = 0.61; 11			8: 6HR =	1 95: 24H	R = 4 02	DEPTH (FEET) = 0.71 HA			(FEET) =	28 57	
3H 0.30, 30H 0.01, H	1111 0.00,	31111 1.3	0, 01110	1.55, 2411	1.02	FLOW VELOCITY (FEET/SEC.					= 1.87
END OF SUBAREA STREET FLO	OW HYDRAIII.	rcs.				LONGEST FLOWPATH FROM N					
DEPTH (FEET) = 0.59 HALI			FEET) =	22 53		Edwold TEdwillin Thom I	20020.	.00 10 1101	20020.	00 02	.10.91 1221.
FLOW VELOCITY (FEET/SEC.)		,	,		= 2 43	*****	******	******	*****	*****	*****
LONGEST FLOWPATH FROM NO			,			FLOW PROCESS FROM NODE	20628 00 1	O NODE 2	0629 00 т.	S CODE =	63
Bondbor rhowinin rhon hor	20020.0	JO IO NODE	20027.0	.0 21	J1.JJ 1221.						
*****	******	*****	******	*****	*****	>>>>COMPUTE STREET FLO	OW TRAVEL TI	ME THRU S	UBAREA<<	<<	
FLOW PROCESS FROM NODE	20627.00 TO	NODE 20	628.00 IS	CODE =	63	>>>> (STREET TABLE SECT					
										=======	
>>>>COMPUTE STREET FLOW	TRAVEL TIM	ME THRU SU	BAREA<<<	<<		UPSTREAM ELEVATION (FEET	$\Gamma$ ) = 2108.00	DOWNSTR	EAM ELEVA	TION (FEET)	= 2103.00
>>>> (STREET TABLE SECTION	ON # 5 USE	ED) <<<<				STREET LENGTH (FEET) =	256.63	CURB HEIGH	T (INCHES)	= 6.0	
	========		=======		========	STREET HALFWIDTH (FEET)	= 18.00				
UPSTREAM ELEVATION (FEET)	= 2110.00	DOWNSTRE	AM ELEVAI	CION (FEET)	= 2108.00						
STREET LENGTH (FEET) =	486.92 Ct	JRB HEIGHT	(INCHES)	= 6.0		DISTANCE FROM CROWN TO	CROSSFALL G	GRADEBREAK	(FEET) =	10.00	
STREET HALFWIDTH (FEET) =	18.00					INSIDE STREET CROSSFALI	L(DECIMAL) =	- 0.020			
						OUTSIDE STREET CROSSFAI	LL(DECIMAL)	= 0.020	ı		
DISTANCE FROM CROWN TO C	ROSSFALL GF	RADEBREAK (	FEET) =	10.00							
INSIDE STREET CROSSFALL(	DECIMAL) =	0.020				SPECIFIED NUMBER OF HAI	LFSTREETS CA	ARRYING RU	NOFF = 2		
OUTSIDE STREET CROSSFALL	(DECIMAL)	= 0.020				STREET PARKWAY CROSSFAI	LL(DECIMAL)	= 0.020	ı		
						Manning's FRICTION FACT					
SPECIFIED NUMBER OF HALFS	STREETS CAP	RRYING RUN	OFF = 2			Manning's FRICTION FACT	TOR for Back	k-of-Walk	Flow Sect	ion = 0.	.0200
STREET PARKWAY CROSSFALL						MAXIMUM ALLOWABLE STREE	ET FLOW DEPI	TH(FEET) =	0.90		
Manning's FRICTION FACTOR											
Manning's FRICTION FACTOR				on = 0.	0200	**TRAVEL TIME COMPUTE		TIMATED FI	OW (CFS) =	46.9	90
MAXIMUM ALLOWABLE STREET	FLOW DEPTH	H(FEET) =	0.90			***STREET FLOWING FUI					
						STREETFLOW MODEL RESU			FLOW:		
**TRAVEL TIME COMPUTED		IMATED FLO	W(CFS) =	47.1	7	STREET FLOW DEPTH(FE	•				
***STREET FLOWING FULL						HALFSTREET FLOOD WID					
STREETFLOW MODEL RESULT			LOW:			AVERAGE FLOW VELOCITY					
STREET FLOW DEPTH (FEET)						PRODUCT OF DEPTH&VELO		,			
HALFSTREET FLOOD WIDTH						STREET FLOW TRAVEL TIME	, ,		,	26.66	
AVERAGE FLOW VELOCITY()						* 10 YEAR RAINFALL INT		H/HR) = 1	.302		
PRODUCT OF DEPTH&VELOC						SUBAREA LOSS RATE DATA	,				
STREET FLOW TRAVEL TIME (				25.74		DEVELOPMENT TYPE/	SCS SOIL		Fp	Ap	SCS
* 10 YEAR RAINFALL INTE		'HR) = 1.	329				GROUP (	(ACRES) (	INCH/HR)	(DECIMAL)	CN
SUBAREA LOSS RATE DATA (AI			_			RESIDENTIAL	_	0 00	0 ==	0	F.C.
	SCS SOIL		Fp	Ap	SCS	"8-10 DWELLINGS/ACRE"	В	0.98	0.75	0.400	56
	GROUP (A	ACRES) (I	NCH/HR)	(DECIMAL)	CN	RESIDENTIAL	_	0 00	0 ==	0 000	F.C.
RESIDENTIAL	_	1 05	0 ==	0	5.0	".4 DWELLING/ACRE"	В	0.92	0.75	0.900	56
"8-10 DWELLINGS/ACRE"	В	1.07	0.75	0.400	56	RESIDENTIAL	_				
RESIDENTIAL						"3-4 DWELLINGS/ACRE"	В	3.13	0.75	0.600	56
Date: 04/21/2014	File name:	LR0206ZZ.RE	S		Page 21	Date: 04/21/2014	File name	: LR0206ZZ.F	RES		Page 22

```
COMMERCIAL
                         В
                              0.27 0.75 0.100 56
                                                                                  SUBAREA AREA (ACRES) = 8.38 SUBAREA RUNOFF (CFS) = 7.10
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  EFFECTIVE AREA(ACRES) = 72.86 AREA-AVERAGED Fm(INCH/HR) = 0.47
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.67
 SUBAREA AREA (ACRES) = 5.30 SUBAREA RUNOFF (CFS) = 4.10
                                                                                  TOTAL AREA(ACRES) = 72.9
                                                                                                                 PEAK FLOW RATE(CFS) =
 EFFECTIVE AREA(ACRES) = 64.48 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.70
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 64.5 PEAK FLOW RATE (CFS) = 47.13
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                  DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.99 DEPTH*VELOCITY (FT*FT/SEC.) = 2.91
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20630.00 = 3753.80 FEET.
 DEPTH (FEET) = 0.57 HALFSTREET FLOOD WIDTH (FEET) = 21.67
 FLOW VELOCITY (FEET/SEC.) = 4.65 DEPTH*VELOCITY (FT*FT/SEC.) = 2.67
                                                                                ******************
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20629.00 = 3475.54 FEET.
                                                                                  FLOW PROCESS FROM NODE 20630.00 TO NODE 20631.00 IS CODE = 63
                                                                                ______
*******************
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW PROCESS FROM NODE 20629.00 TO NODE 20630.00 IS CODE = 63
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                _____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  UPSTREAM ELEVATION(FEET) = 2097.00 DOWNSTREAM ELEVATION(FEET) = 2088.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  STREET LENGTH (FEET) = 362.66 CURB HEIGHT (INCHES) = 6.0
______
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 UPSTREAM ELEVATION(FEET) = 2103.00 DOWNSTREAM ELEVATION(FEET) = 2097.00
 STREET LENGTH (FEET) = 278.26 CURB HEIGHT (INCHES) = 6.0
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
                                                                                    ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                   STREET FLOW DEPTH (FEET) = 0.58
   ***STREET FLOWING FULL***
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 22.16
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.36
   STREET FLOW DEPTH(FEET) = 0.58
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.12
   HALFSTREET FLOOD WIDTH (FEET) = 21.80
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 28.72
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.95
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.245
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.85
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 27.60
                                                                                  DEVELOPMENT TYPE/
                                                                                                      SCS SOIL AREA
                                                                                                                         Fρ
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.275
                                                                                      LAND USE
                                                                                                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                        SCS
                                                                                  "8-10 DWELLINGS/ACRE"
                                                                                                       B 1.22
                                                                                                                          0.75
                                                                                                                                  0.400
                                                                                                         B 3.44
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                                          0.75
                                                                                                                                  0.350
     LAND USE
                                                                                  CONDOMINIUMS
 CONDOMINIUMS
                       В
                                2.76
                                         0.75
                                                 0.350
                                                                                  RESIDENTIAL
 RESIDENTIAL
                                                                                  ".4 DWELLING/ACRE"
                                                                                                         B 0.22
                                                                                                                          0.75
                                                                                                                                  0.900
 "8-10 DWELLINGS/ACRE" B 0.90
                                         0.75
                                                 0.400
                                                       56
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       В
                                                                                                             2.91
                                                                                                                          0.75
 RESIDENTIAL
                                                                                                                                  0.600
 ".4 DWELLING/ACRE"
                      в 1.30
                                         0.75
                                                 0.900
                                                       56
                                                                                  COMMERCIAL
                                                                                                         В
                                                                                                                 1.38
                                                                                                                          0.75 0.100
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                                1.80
                                         0.75
                                                 0.600
                                                       56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
                         В
                                1.62
                                                 0.100
                                                                                  SUBAREA AREA (ACRES) = 9.17 SUBAREA RUNOFF (CFS) = 7.73
 COMMERCIAL
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  EFFECTIVE AREA(ACRES) = 82.03 AREA-AVERAGED Fm(INCH/HR) = 0.45
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.446
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.64
```

52.68

56.55

56

56

Date: 04/21/2014 Date: 04/21/2014 File name: LR0206ZZ.RES Page 24 File name: LR020677.RFS Page 23

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.28 FLOW VELOCITY (FEET/SEC.) = 5.86 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.43 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20632.00 = 4388.35 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20632.00 TO NODE 20633.00 IS CODE = 63 \_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< UPSTREAM ELEVATION(FEET) = 2080.00 DOWNSTREAM ELEVATION(FEET) = 2074.00 STREET LENGTH (FEET) = 252.32 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 71.04 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.63HALFSTREET FLOOD WIDTH (FEET) = 24.30 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.66 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.55STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 30.24 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.207 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS Αn LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "8-10 DWELLINGS/ACRE" B 4.07 0.75 0.400 56 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 3.86 0.600 56 0.75 RESIDENTIAL ".4 DWELLING/ACRE" В 20.53 0.75 0.900 56 1.08 0.75 0 100 COMMERCIAL В MOBILE HOME PARK B 0.18 0.75 0.250 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760 SUBAREA AREA(ACRES) = 29.72 SUBAREA RUNOFF(CFS) = 17.08 EFFECTIVE AREA (ACRES) = 118.66 AREA-AVERAGED Fm (INCH/HR) = 0.48 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66 TOTAL AREA (ACRES) = 118.7 PEAK FLOW RATE (CFS) = 78.12 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02 END OF SUBAREA STREET FLOW HYDRAULICS:

Date: 04/21/2014

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02

```
DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 25.21
 FLOW VELOCITY (FEET/SEC.) = 5.81 DEPTH*VELOCITY (FT*FT/SEC.) = 3.74
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 252.3 FT WITH ELEVATION-DROP = 6.0 FT, IS 71.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20633.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20633.00 = 4640.67 FEET.
******************
 FLOW PROCESS FROM NODE 20633.00 TO NODE 20644.00 IS CODE = 63
-----
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2074.00 DOWNSTREAM ELEVATION(FEET) = 2068.00
 STREET LENGTH (FEET) = 104.43 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                78.42
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.50
 STREET FLOW TRAVEL TIME (MIN.) = 0.22 Tc (MIN.) = 30.46
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.201
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               αA
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.22
                                         0.75
                                                0.400 56
                      В
 COMMERCIAL
                               0.35
                                         0.75
                                                0.100 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                      в 0.11
                                      0.75
                                                0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
 SUBAREA AREA(ACRES) = 0.68 SUBAREA RUNOFF(CFS) = 0.59
 EFFECTIVE AREA(ACRES) = 119.34 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 119.3 PEAK FLOW RATE (CFS) = 78.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.37
 FLOW VELOCITY (FEET/SEC.) = 7.92 DEPTH*VELOCITY (FT*FT/SEC.) = 4.49
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET.
```

```
FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 30.46
 RAINFALL INTENSITY (INCH/HR) = 1.20
 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 119.34
 TOTAL STREAM AREA(ACRES) = 119.34
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 78.15
******************
 FLOW PROCESS FROM NODE 20640.00 TO NODE 20641.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1072.64
 ELEVATION DATA: UPSTREAM(FEET) = 2182.00 DOWNSTREAM(FEET) = 2120.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.781
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.241
 SUBAREA To AND LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 SCS Tc
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 7.20
                                    0.75 0.400
                                                  56 10.78
 NATURAL FAIR COVER
 "OPEN BRUSH"
                     В
                          2.52 0.61 1.000
                                                  66 20.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556
 SUBAREA RUNOFF (CFS) = 16.27
 TOTAL AREA (ACRES) = 9.72 PEAK FLOW RATE (CFS) = 16.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
******************
 FLOW PROCESS FROM NODE 20641.00 TO NODE 20642.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2119.00
 STREET LENGTH (FEET) = 375.42 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

\*

Date: 04/21/2014 File name: LR0206ZZ.RES Page 27

File name: LR020677.RFS

Page 28

Date: 04/21/2014

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.47
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.57
   HALFSTREET FLOOD WIDTH (FEET) = 21.67
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.72
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 0.99
 STREET FLOW TRAVEL TIME (MIN.) = 3.63 Tc (MIN.) = 14.41
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.883
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                      В 1.12
 "OPEN BRUSH"
                                         0.61 1.000
                                                       66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78 0.75 0.400 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.754
 SUBAREA AREA (ACRES) = 1.90 SUBAREA RUNOFF (CFS) = 2.39
 EFFECTIVE AREA(ACRES) = 11.62 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) =
                                                          16.27
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 21.12
 FLOW VELOCITY (FEET/SEC.) = 1.68 DEPTH*VELOCITY (FT*FT/SEC.) = 0.95
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20642.00 = 1448.06 FEET.
******************
 FLOW PROCESS FROM NODE 20642.00 TO NODE 20643.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION (FEET) = 2119.00 DOWNSTREAM ELEVATION (FEET) = 2100.00
 STREET LENGTH (FEET) = 635.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.42
  HALFSTREET FLOOD WIDTH (FEET) = 14.84
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.05
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
 STREET FLOW TRAVEL TIME (MIN.) = 2.61 Tc (MIN.) = 17.02
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.704
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 3.99 0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA (ACRES) = 3.99 SUBAREA RUNOFF (CFS) = 5.04
 EFFECTIVE AREA(ACRES) = 15.61 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.54
 TOTAL AREA (ACRES) = 15.6 PEAK FLOW RATE (CFS) = 18.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.76
 FLOW VELOCITY (FEET/SEC.) = 4.07 DEPTH*VELOCITY (FT*FT/SEC.) = 1.72
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20643.00 = 2083.06 FEET.
***********************
 FLOW PROCESS FROM NODE 20643.00 TO NODE 20644.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 2100.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2068.00
 FLOW LENGTH (FEET) = 663.17 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 7.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.76
 PIPE-FLOW(CFS) =
                 18.70
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.80 Tc (MIN.) = 17.82
 LONGEST FLOWPATH FROM NODE 20640.00 TO NODE 20644.00 = 2746.23 FEET.
****************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 17.82
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.657
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                              αA
                                                    SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 1.89
                                      0.75
                                             0.400
```

Date: 04/21/2014 File name: LR0206ZZ.RES

18 79

Page 30

Date: 04/21/2014 Page 29 File name: LR020677.RFS

```
RESTDENTIAL
                                                                                UPSTREAM ELEVATION(FEET) = 2068.00 DOWNSTREAM ELEVATION(FEET) = 2059.00
 "3-4 DWELLINGS/ACRE"
                    в 0.02
                                       0.75 0.600 56
                                                                                STREET LENGTH (FEET) = 221.04 CURB HEIGHT (INCHES) = 6.0
            B 0.11 0.75 0.100 56
 COMMERCIAL
                                                                                STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 SUBAREA AREA (ACRES) = 2.02 SUBAREA RUNOFF (CFS) = 2.49
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 EFFECTIVE AREA(ACRES) = 17.63 AREA-AVERAGED Fm(INCH/HR) = 0.36
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.52
 TOTAL AREA (ACRES) = 17.6 PEAK FLOW RATE (CFS) = 20.54
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
******************
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20644.00 IS CODE = 1
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 105.03
-----
                                                                                 ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<-<-
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
                                                                                 STREET FLOW DEPTH (FEET) = 0.65
_____
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 25.46
 TOTAL NUMBER OF STREAMS = 2
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.67
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.98
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 18.30
 TIME OF CONCENTRATION (MIN.) = 17.82
 RAINFALL INTENSITY (INCH/HR) = 1.66
                                                                                * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.631
 AREA-AVERAGED Fm(INCH/HR) = 0.36
                                                                                SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp (INCH/HR) = 0.70
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Ap = 0.52
                                                                                    LAND USE
 EFFECTIVE STREAM AREA(ACRES) = 17.63
                                                                                RESIDENTIAL
                                                                                "8-10 DWELLINGS/ACRE" B 0.33 0.75
 TOTAL STREAM AREA(ACRES) = 17.63
                                                                                                                              0.400
                                                                                                                                      56
                                                                                                    B 2.57 0.75
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                                                              0.100
                                                                                                                                      56
                                                                                COMMERCIAL
                                                                                RESIDENTIAL
 ** CONFLUENCE DATA **
                                                                                ".4 DWELLING/ACRE" B 6.71
                                                                                                                       0.75
                                                                                                                              0.900
                                                                                                                                      56
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                RESIDENTIAL
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                "3-4 DWELLINGS/ACRE" B 9.85
                                                                                                                       0.75
                                                                                                                              0.600
                                                                                MOBILE HOME PARK
   1 78.15 30.46 1.201 0.72(0.47) 0.66 119.3 20620.00
                                                                                                    В
                                                                                                              0.01
                                                                                                                      0.75 0.250
           20.54 17.82 1.657 0.70(0.36) 0.52 17.6 20640.00
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                                SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 20.27
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                                EFFECTIVE AREA(ACRES) = 106.92 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.63
 ** PEAK FLOW RATE TABLE **
                                                                                TOTAL AREA (ACRES) = 156.4 PEAK FLOW RATE (CFS) = 113.11
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  NUMBER
    1
           94.90 17.82 1.657 0.72(0.45) 0.63 87.5 20640.00
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
    2
           91.45 30.46 1.201 0.72(0.46)0.64 137.0 20620.00
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.19
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 94.90 Tc (MIN.) = 17.82
                                                                                FLOW VELOCITY (FEET/SEC.) = 7.83 DEPTH*VELOCITY (FT*FT/SEC.) = 5.20
 EFFECTIVE AREA(ACRES) = 87.45 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.63
                                                                                ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 TOTAL AREA (ACRES) = 137.0
                                                                                ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20644.00 = 4745.10 FEET.
                                                                                PIPE-FLOW VELOCITY (FEET/SEC.) = 13.38
                                                                                PIPE-FLOW(CFS) =
                                                                                                42.08
*****************
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 18.10
 FLOW PROCESS FROM NODE 20644.00 TO NODE 20645.00 IS CODE = 63
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.642
                                                                                SUBAREA AREA (ACRES) = 19.47 SUBAREA RUNOFF (CFS) = 20.47
                                                                                TOTAL AREA (ACRES) = 156.4 PEAK FLOW RATE (CFS) = 114.17
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 31

File name: LR0206ZZ.RES

Page 32

Date: 04/21/2014

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                                 RESIDENTIAL
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                  ".4 DWELLING/ACRE" B 0.22 0.75 0.900 56
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 72.09
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
   ***STREET FLOWING FULL***
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.302
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA AREA (ACRES) = 15.83 SUBAREA RUNOFF (CFS) = 19.71
                                                                                 EFFECTIVE AREA(ACRES) = 122.75 AREA-AVERAGED Fm(INCH/HR) = 0.62
   STREET FLOW DEPTH (FEET) = 0.58
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.85
   HALFSTREET FLOOD WIDTH (FEET) = 22.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.86
                                                                                 TOTAL AREA (ACRES) = 172.3
                                                                                                                 PEAK FLOW RATE (CFS) = 114.17
                                                                                 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.00
 ** PEAK FLOW RATE TABLE **
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          114.17 18.10 1.642 0.72(0.46) 0.63 106.9 20640.00
    1
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
          103.29 30.74 1.195 0.72(0.46)0.64 156.4 20620.00
                                                                                 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 26.01
 NEW PEAK FLOW DATA ARE:
                                                                                 FLOW VELOCITY (FEET/SEC.) = 8.01 DEPTH*VELOCITY (FT*FT/SEC.) = 5.29
 PEAK FLOW RATE (CFS) = 114.17 Tc (MIN.) = 18.10
                                                                                 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 AREA-AVERAGED Fm (INCH/HR) = 0.46 AREA-AVERAGED Fp (INCH/HR) = 0.72
                                                                                 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 AREA-AVERAGED Ap = 0.63 EFFECTIVE AREA(ACRES) = 106.92
                                                                                 ASSUME FULL-FLOWING PIPELINE
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20645.00 = 4966.14 FEET.
                                                                                 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.74
                                                                                 PIPE-FLOW(CFS) =
                                                                                                    43.22
********************
                                                                                 PIPEFLOW TRAVEL TIME (MIN.) = 0.37 Tc (MIN.) = 18.47
 FLOW PROCESS FROM NODE 20645.00 TO NODE 20646.00 IS CODE = 63
                                                                                  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.622
                                                                                 SUBAREA AREA(ACRES) = 15.83 SUBAREA RUNOFF(CFS) = 19.90
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 TOTAL AREA (ACRES) = 172.3 PEAK FLOW RATE (CFS) = 114.17
                                                                                 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2059.00 DOWNSTREAM ELEVATION(FEET) = 2046.00
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET LENGTH (FEET) = 302.67 CURB HEIGHT (INCHES) = 6.0
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
                                                                                 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 70.95
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   ***STREET FLOWING FULL***
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   STREET FLOW DEPTH (FEET) = 0.57
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 21.74
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.97
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.01
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ** PEAK FLOW RATE TABLE **
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
                                                                                  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                                  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                          132.18 18.47 1.622 0.72(0.43) 0.59 122.8 20640.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 124.03
                                                                                     2 115.78 31.11 1.186 0.72(0.44) 0.61 172.3 20620.00
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 NEW PEAK FLOW DATA ARE:
                                                                                  PEAK FLOW RATE (CFS) = 132.18 Tc (MIN.) = 18.47
   STREET FLOW DEPTH(FEET) = 0.68
                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.72
   HALFSTREET FLOOD WIDTH (FEET) = 26.86
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.18
                                                                                 AREA-AVERAGED Ap = 0.59 EFFECTIVE AREA(ACRES) = 122.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.54
                                                                                 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20646.00 = 5268.81 FEET.
 STREET FLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 18.72
                                                                                ******************
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.609
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  FLOW PROCESS FROM NODE 20646.00 TO NODE 20647.00 IS CODE = 31
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                ______
                                      Fρ
                                               αA
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                                 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
 "8-10 DWELLINGS/ACRE" B 9.08
                                         0.75
                                                 0.400 56
                                                                                _____
                      в 5.79
                                         0.75
                                                0.100
                                                      56
 COMMERCIAL
                                                                                 ELEVATION DATA: UPSTREAM(FEET) = 2046.00 DOWNSTREAM(FEET) = 2030.00
 RESIDENTIAL
                                                                                 FLOW LENGTH (FEET) = 325.06 MANNING'S N = 0.013
 "5-7 DWELLINGS/ACRE"
                                0.74
                                         0.75
                                                0.500 56
                                                                                 DEPTH OF FLOW IN 36.0 INCH PIPE IS 28.5 INCHES
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 33

Date: 04/21/2014 File name: LR0206ZZ.RES

```
PIPE-FLOW VELOCITY(FEET/SEC.) = 21.99
                                                                          PIPE TRAVEL TIME (MIN.) = 0.11 Tc (MIN.) = 18.82
 ESTIMATED PIPE DIAMETER (INCH) = 36.00
                                NUMBER OF PIPES = 1
                                                                          LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
 PIPE-FLOW(CFS) = 132.18
 PIPE TRAVEL TIME (MIN.) = 0.25 Tc (MIN.) = 18.71
                                                                        LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20647.00 = 5593.87 FEET.
                                                                          FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 81
                                                                         ______
*******************
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20647.00 TO NODE 20647.00 IS CODE = 81
                                                                        ______
_____
                                                                          MAINLINE Tc(MIN.) = 18.82
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.604
______
                                                                          SUBAREA LOSS RATE DATA (AMC II):
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
 MAINLINE Tc (MIN.) = 18.71
                                                                             LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.610
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          RESIDENTIAL
                                                                          "5-7 DWELLINGS/ACRE" B
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                  SCS
                                                                                                      0.31
                                                                                                              0.75 0.500
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    В
                           20.06
                                            0.250 56
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 MOBILE HOME PARK
                                     0.75
                                                                          SUBAREA AREA (ACRES) = 0.31 SUBAREA RUNOFF (CFS) = 0.34
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                            29.79
                                     0.75
                                            0.900
                                                   56
                                                                          EFFECTIVE AREA(ACRES) = 235.78 AREA-AVERAGED Fm(INCH/HR) = 0.40
 RESIDENTIAL
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.55
 "3-4 DWELLINGS/ACRE"
                      В
                            14.97
                                     0.75
                                            0.600
                                                   56
                                                                          TOTAL AREA (ACRES) =
                                                                                             285.3
                                                                                                       PEAK FLOW RATE(CFS) =
 RESIDENTIAL
                                                                          NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                         13.31
 "8-10 DWELLINGS/ACRE"
                      В
                                     0.75
                                            0.400
                                                   56
 COMMERCIAL
                            16.98
                                     0.75
                                            0.100
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
                                                                          5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 "5-7 DWELLINGS/ACRE"
                   В 17.61
                                     0.75
                                            0.500
                                                                        ********************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
                                                                          FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 11
 SUBAREA AREA(ACRES) = 112.72 SUBAREA RUNOFF(CFS) = 125.16
 EFFECTIVE AREA(ACRES) = 235.47 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                          >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                        ______
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 285.0
                            PEAK FLOW RATE(CFS) =
                                                                          ** MAIN STREAM CONFLUENCE DATA **
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          STREAM
                                                                                   0
                                                                                         Tc Intensity Fp(Fm)
                                                                                                                   Ae
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                           1
                                                                                  255.91 18.82 1.604 0.73 (0.40) 0.55 235.8 20640.00
 ** PEAK FLOW RATE TABLE **
                                                                             2
                                                                                  196.56 31.48
                                                                                               1.178 0.73(0.41)0.57 285.3 20620.00
         Q Tc Intensity Fp(Fm)
                                       Ap Ae HEADWATER
                                                                          LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
         255.91 18.71 1.610 0.73(0.40) 0.55 235.5 20640.00
                                                                          ** MEMORY BANK # 1 CONFLUENCE DATA **
         196.56 31.36 1.181 0.73(0.41) 0.57 285.0 20620.00
                                                                                    Q
                                                                                        Tc Intensity Fp(Fm)
                                                                                                              Ap Ae
 NEW PEAK FLOW DATA ARE:
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            1
                                                                                  103.15 29.28 1.230 0.75(0.44) 0.58 144.5 20600.00
 PEAK FLOW RATE (CFS) = 255.91 Tc (MIN.) = 18.71
 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.73
                                                                          LONGEST FLOWPATH FROM NODE 20600.00 TO NODE 20648.00 = 5640.37 FEET.
 AREA-AVERAGED Ap = 0.55 EFFECTIVE AREA(ACRES) = 235.47
                                                                          ** PEAK FLOW RATE TABLE **
******************
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 FLOW PROCESS FROM NODE 20647.00 TO NODE 20648.00 IS CODE = 31
                                                                          NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                    (ACRES) NODE
                                                                            1
                                                                                  353.44 18.82 1.604 0.74(0.41) 0.56 328.6 20640.00
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  309.99 29.28 1.230 0.74(0.42) 0.57
 >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <<<<
                                                                            3
                                                                                  292.94 31.48 1.178 0.74(0.42)0.57 429.8 20620.00
_____
                                                                           TOTAL AREA(ACRES) =
                                                                                                429.8
 ELEVATION DATA: UPSTREAM(FEET) = 2030.00 DOWNSTREAM(FEET) = 2025.00
 FLOW LENGTH (FEET) = 149.90 MANNING'S N = 0.013
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 37.8 INCHES
                                                                          PEAK FLOW RATE (CFS) = 353.44 Tc (MIN.) = 18.823
 PIPE-FLOW VELOCITY (FEET/SEC.) = 22.68
                                                                          EFFECTIVE AREA(ACRES) = 328.64 AREA-AVERAGED Fm(INCH/HR) = 0.41
 ESTIMATED PIPE DIAMETER(INCH) = 51.00 NUMBER OF PIPES = 1
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
 PIPE-FLOW(CFS) = 255.91
                                                                          TOTAL AREA (ACRES) = 429.8
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Date: 04/21/2014 File name: LR020677.RFS Page 36

255.91

HEADWATER

HEADWATER

421.2 20600.00

```
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20648.00 = 5743.77 FEET.
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
*******************
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20648.00 IS CODE = 12
                                                                                DEPTH(FEET) = 1.27 HALFSTREET FLOOD WIDTH(FEET) = 56.59
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.46 DEPTH*VELOCITY (FT*FT/SEC.) = 6.94
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                                 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                                      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 FLOW PROCESS FROM NODE 20648.00 TO NODE 20655.00 IS CODE = 63
                                                                                ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                ESTIMATED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
______
                                                                                ASSUME FULL-FLOWING PIPELINE
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 11.66
_____
                                                                                PIPE-FLOW(CFS) = 277.25
 UPSTREAM ELEVATION(FEET) = 2025.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.89 Tc (MIN.) = 19.71
 STREET LENGTH (FEET) = 623.73 CURB HEIGHT (INCHES) = 6.0
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.560
 STREET HALFWIDTH (FEET) = 18.00
                                                                                SUBAREA AREA (ACRES) = 6.80 SUBAREA RUNOFF (CFS) = 7.91
                                                                                TOTAL AREA(ACRES) = 436.6
                                                                                                              PEAK FLOW RATE (CFS) = 353.44
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 76.19
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                  STREET FLOW DEPTH (FEET) = 0.76
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 30.83
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 357.25
   ***STREET FLOWING FULL***
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.92
                                                                                LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET.
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.28
                                                                               ******************
   HALFSTREET FLOOD WIDTH (FEET) = 56.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.47
                                                                                FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.98
 STREET FLOW TRAVEL TIME (MIN.) = 1.90 Tc (MIN.) = 20.72
                                                                                >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.514
                                                                               _______
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                TOTAL NUMBER OF STREAMS = 2
                                                                                CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                                 αA
                                                                                TIME OF CONCENTRATION (MIN.) = 19.71
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                RAINFALL INTENSITY (INCH/HR) = 1.56
 "5-7 DWELLINGS/ACRE"
                               2.58
                                        0.75
                                                0.500
                                                      56
                        В
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.41
                                                0.100
                               3.03
                                        0.75
                                                       56
 COMMERCIAL
                        В
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.74
 RESIDENTIAL
                                                                                AREA-AVERAGED Ap = 0.55
 "3-4 DWELLINGS/ACRE"
                               0.11
                                        0.75
                                                0.600
                                                      56
                                                                                EFFECTIVE STREAM AREA(ACRES) = 335.44
 RESIDENTIAL
                                                                                TOTAL STREAM AREA(ACRES) = 436.56
 "2 DWELLINGS/ACRE"
                               1.00
                                        0.75
                                                0.700
                                                                                PEAK FLOW RATE (CFS) AT CONFLUENCE = 353.44
 NATURAL FAIR COVER
                                                                               "OPEN BRUSH"
                        В
                               0.08
                                        0.61
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
                                                                                FLOW PROCESS FROM NODE 20649.00 TO NODE 20650.00 IS CODE = 21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.359
 SUBAREA AREA(ACRES) = 6.80
                             SUBAREA RUNOFF (CFS) = 7.63
                                                                                >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 EFFECTIVE AREA(ACRES) = 335.44 AREA-AVERAGED Fm(INCH/HR) = 0.41
                                                                                >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.55
                                                                               ______
 TOTAL AREA (ACRES) = 436.6 PEAK FLOW RATE (CFS) = 353.44
                                                                                INITIAL SUBAREA FLOW-LENGTH (FEET) = 545.44
                                                                                ELEVATION DATA: UPSTREAM(FEET) = 2195.00 DOWNSTREAM(FEET) = 2170.00
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                Tc = K^*[(LENGTH^** 3.00)/(ELEVATION CHANGE)]^**0.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 38

```
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.492
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.419
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                    Fр
                                               Ар
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
     LAND USE
 RESIDENTIAL
                                                                                 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 12.96
                      B 5.54
                                        0.75 0.700
                                                       56 10.09
                                                                                 FLOW VELOCITY (FEET/SEC.) = 7.08 DEPTH*VELOCITY (FT*FT/SEC.) = 2.73
 "2 DWELLINGS/ACRE"
                                                                                 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20651.00 = 920.04 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.61 0.75 0.600 56 9.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                                                                                 FLOW PROCESS FROM NODE 20651.00 TO NODE 20652.00 IS CODE = 63
 SUBAREA RUNOFF (CFS) = 12.30
 TOTAL AREA (ACRES) = 7.15 PEAK FLOW RATE (CFS) = 12.30
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               ______
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.02
                                                                                 UPSTREAM ELEVATION(FEET) = 2130.00 DOWNSTREAM ELEVATION(FEET) = 2080.00
                                                                                 STREET LENGTH (FEET) = 427.12 CURB HEIGHT (INCHES) = 6.0
*****************
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20650.00 TO NODE 20651.00 IS CODE = 63
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2130.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 374.60 CURB HEIGHT (INCHES) = 6.0
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.56
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   31.10
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET FLOW DEPTH (FEET) = 0.40
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 13.82
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.67
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.09
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.56
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 11.36
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.171
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.30
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
   STREET FLOW DEPTH (FEET) = 0.36
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 11.55
                                                                                 RESIDENTIAL
                                                                                 "2 DWELLINGS/ACRE"
                                                                                                     B 6.22 0.75 0.700
                                                                                                                                        56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.37
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 10.43
                                                                                 "3-4 DWELLINGS/ACRE" B 1.35 0.75 0.600
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.285
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              αA
                                                                                 SUBAREA AREA(ACRES) = 7.57 SUBAREA RUNOFF(CFS) = 11.32
                                                                                 EFFECTIVE AREA(ACRES) = 23.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 7.90
                                                                                 TOTAL AREA (ACRES) = 23.5 PEAK FLOW RATE (CFS) = 35.13
                                     0.75
                                                0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.89
                                        0.75
                                               0.600 56
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 8.79 SUBAREA RUNOFF (CFS) = 14.00
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 15.94 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                 FLOW VELOCITY (FEET/SEC.) = 7.89 DEPTH*VELOCITY (FT*FT/SEC.) = 3.29
                                                                                 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20652.00 = 1347.16 FEET.
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 25.44
```

File name: LR0206ZZ.RES Page 40

Date: 04/21/2014

```
STREET LENGTH (FEET) = 283.32 CURB HEIGHT (INCHES) = 6.0
********************
                                                                                STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 20652.00 TO NODE 20653.00 IS CODE = 63
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 2080.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 432.48 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                              40.63
                                                                                  ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 STREET FLOW DEPTH(FEET) = 0.51
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 18.50
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.36
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.73
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 13.22
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.983
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.44
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fρ
                                                                                                                                      SCS
   HALFSTREET FLOOD WIDTH (FEET) = 15.70
                                                                                    LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.39
                                                                                                            0.22 0.75
                                                                                                                              0.100
                                                                                COMMERCIAL
                                                                                                     В
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.25
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 0.46 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 12.34
                                                                                                                              0.600
                                                                                                                                      56
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.067
                                                                                RESIDENTIAL
                                                                                                    B 1.74 0.75 0.700
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                "2 DWELLINGS/ACRE"
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                      SCS
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
 RESIDENTIAL
                                                                                SUBAREA AREA(ACRES) = 2.42 SUBAREA RUNOFF(CFS) = 3.30
 "2 DWELLINGS/ACRE" B 3.90
                                        0.75
                                                0.700 56
                                                                                EFFECTIVE AREA(ACRES) = 30.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600 56
                                                                                TOTAL AREA (ACRES) = 30.3 PEAK FLOW RATE (CFS) = 40.18
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 4.35 SUBAREA RUNOFF(CFS) = 6.07
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 EFFECTIVE AREA(ACRES) = 27.86 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA(ACRES) = 27.9 PEAK FLOW RATE(CFS) =
                                                                                DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.44
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.33 DEPTH*VELOCITY (FT*FT/SEC.) = 2.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20654.00 = 2062.96 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                              *******************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                FLOW PROCESS FROM NODE 20654.00 TO NODE 20655.00 IS CODE = 63
 DEPTH(FEET) = 0.44 HALFSTREET FLOOD WIDTH(FEET) = 15.85
                                                                               ______
 FLOW VELOCITY (FEET/SEC.) = 7.41 DEPTH*VELOCITY (FT*FT/SEC.) = 3.28
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20653.00 = 1779.64 FEET.
                                                                               >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              ______
UPSTREAM ELEVATION(FEET) = 2030.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 FLOW PROCESS FROM NODE 20653.00 TO NODE 20654.00 IS CODE = 63
                                                                                STREET LENGTH (FEET) = 164.56 CURB HEIGHT (INCHES) = 6.0
______
                                                                                STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
_____
                                                                                INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014

File name: LR020677.RFS

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.49
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.38
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.04
 STREET FLOW TRAVEL TIME (MIN.) = 0.43 Tc(MIN.) = 13.65
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.945
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                B 0.41 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
 SUBAREA AREA (ACRES) = 0.41 SUBAREA RUNOFF (CFS) = 0.69
 EFFECTIVE AREA(ACRES) = 30.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 30.7 PEAK FLOW RATE (CFS) = 40.18
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.41
 FLOW VELOCITY (FEET/SEC.) = 6.38 DEPTH*VELOCITY (FT*FT/SEC.) = 3.03
 LONGEST FLOWPATH FROM NODE 20649.00 TO NODE 20655.00 = 2227.52 FEET.
******************
 FLOW PROCESS FROM NODE 20655.00 TO NODE 20655.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 13.65
 RAINFALL INTENSITY (INCH/HR) = 1.95
 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.67
 EFFECTIVE STREAM AREA(ACRES) = 30.69
 TOTAL STREAM AREA(ACRES) = 30.69
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 40.18
 ** CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          353.44 19.71 1.560 0.74(0.41) 0.55 335.4 20640.00
    1
          309.99 30.18 1.208 0.74(0.42) 0.57 428.0 20600.00
          292.94 32.37 1.159 0.74(0.42) 0.57
                                                436.6 20620.00
```

40.18 13.65 1.945 0.75(0.50) 0.67 30.7 20649.00 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS. \*\* PEAK FLOW RATE TABLE \*\* O Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 366.71 13.65 1.945 0.74(0.42) 0.57 262.9 20649.00 1 382.88 19.71 1.560 0.74(0.42) 0.56 366.1 20640.00 329.65 30.18 1.208 0.74(0.42) 0.57 458.7 20600.00 3 311.20 32.37 1.159 0.74(0.43) 0.58 467.2 20620.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 382.88 Tc (MIN.) = 19.71 EFFECTIVE AREA(ACRES) = 366.13 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56 TOTAL AREA (ACRES) = 467.2 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20655.00 = 6367.50 FEET. \* FLOW PROCESS FROM NODE 20655.00 TO NODE 20656.00 IS CODE = 63 \_\_\_\_\_\_ >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2014.00 STREET LENGTH (FEET) = 238.44 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.85 \*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 384.83 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 1.07HALFSTREET FLOOD WIDTH (FEET) = 46.64 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.70 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 9.33STREET FLOW TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 20.17 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.539 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" B 0.66
COMMERCIAL B 1.28 0.75 0.500 56 0.75 0.100 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.16 0.75 0.600 56 RESIDENTIAL

Date: 04/21/2014

```
"2 DWELLINGS/ACRE"
                       В
                               1.49 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.445
 SUBAREA AREA(ACRES) = 3.59 SUBAREA RUNOFF(CFS) = 3.90
 EFFECTIVE AREA(ACRES) = 369.72 AREA-AVERAGED Fm(INCH/HR) = 0.42
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.56
 TOTAL AREA (ACRES) = 470.8
                                 PEAK FLOW RATE (CFS) = 382.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.07 HALFSTREET FLOOD WIDTH(FEET) = 46.52
 FLOW VELOCITY (FEET/SEC.) = 8.70 DEPTH*VELOCITY (FT*FT/SEC.) = 9.31
  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 18.07
 PIPE-FLOW(CFS) = 287.63
 PIPEFLOW TRAVEL TIME (MIN.) = 0.22 Tc (MIN.) = 19.93
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550
 SUBAREA AREA(ACRES) = 3.59 SUBAREA RUNOFF(CFS) = 3.93
 TOTAL AREA (ACRES) = 470.8 PEAK FLOW RATE (CFS) = 382.88
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 95.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.25
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.24
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20656.00 = 6605.94 FEET.
*******************
 FLOW PROCESS FROM NODE 20656.00 TO NODE 20657.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2014.00 DOWNSTREAM ELEVATION(FEET) = 2004.00
 STREET LENGTH (FEET) = 422.05 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 1.10
 HALFSTREET FLOOD WIDTH (FEET) = 48.04
 AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.58
 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 9.44
STREET FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 20.75
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.513
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                         Fρ
    LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE" B 0.99
                                          0.75
                                                  0.500
                                                           56
COMMERCIAL
                      B 2.55
                                          0.75
                                                  0.100
                                                           56
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 3.13
                                          0.75
                                                  0.600
                                                           56
RESIDENTIAL
                              35.47 0.75 0.700
"2 DWELLINGS/ACRE"
                      В
                                                           56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.652
SUBAREA AREA (ACRES) = 42.14 SUBAREA RUNOFF (CFS) = 38.88
EFFECTIVE AREA(ACRES) = 411.86 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
TOTAL AREA (ACRES) = 513.0 PEAK FLOW RATE (CFS) = 403.79
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.10 HALFSTREET FLOOD WIDTH(FEET) = 48.10
FLOW VELOCITY (FEET/SEC.) = 8.59 DEPTH*VELOCITY (FT*FT/SEC.) = 9.47
*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
      THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY (FEET/SEC.) = 18.18
PIPE-FLOW(CFS) = 322.40
PIPEFLOW TRAVEL TIME (MIN.) = 0.39 Tc (MIN.) = 20.32
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.532
SUBAREA AREA(ACRES) = 42.14 SUBAREA RUNOFF(CFS) = 39.61
TOTAL AREA(ACRES) = 513.0
                                 PEAK FLOW RATE (CFS) = 410.92
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
STREETFLOW HYDRAULICS BASED ON MAINLINE To :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 88.52
 ***STREET FLOWING FULL***
 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET FLOW DEPTH (FEET) = 0.67
 HALFSTREET FLOOD WIDTH (FEET) = 26.43
```

Date: 04/21/2014 File name: LR0206ZZ.RES Page 45 Date: 04/21/2014 File name: LR0206ZZ.RES

AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.02 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 4.02

```
** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          407.47 14.25 1.895 0.74(0.43) 0.58 308.6 20649.00
    1
          410.92 20.32 1.532 0.74(0.42) 0.57 411.9 20640.00
          347.47 30.78 1.194 0.74(0.43) 0.58
                                               504.4 20600.00
          331.12 32.93 1.147 0.74(0.43) 0.58 513.0 20620.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 410.92 Tc (MIN.) = 20.32
 AREA-AVERAGED Fm(INCH/HR) = 0.42 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.57 EFFECTIVE AREA(ACRES) = 411.86
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20657.00 = 7027.99 FEET.
******************
 FLOW PROCESS FROM NODE 20657.00 TO NODE 20658.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2004.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
 STREET LENGTH (FEET) = 653.95 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 420.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 1.42
   HALFSTREET FLOOD WIDTH (FEET) = 63.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 7.23
 STREET FLOW TRAVEL TIME (MIN.) = 2.14 Tc (MIN.) = 22.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.443
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              αA
                                                       SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 1.69
                                        0.75
                                                0.500
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 14.94
                                        0.75
                                                0.700
 COMMERCIAL
                      В 1.47
                                        0.75
                                                0.100
 NATURAL FAIR COVER
 "OPEN BRUSH"
                               1.34
                                        0.61
                                                1.000
                                                       66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     в 1.78
                                        0.75
                                              0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
```

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.653
 SUBAREA AREA (ACRES) = 21.22 SUBAREA RUNOFF (CFS) = 18.38
 EFFECTIVE AREA(ACRES) = 433.08 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.58
 TOTAL AREA (ACRES) = 534.2 PEAK FLOW RATE (CFS) = 410.92
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.41 HALFSTREET FLOOD WIDTH(FEET) = 63.36
 FLOW VELOCITY (FEET/SEC.) = 5.07 DEPTH*VELOCITY (FT*FT/SEC.) = 7.14
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 11.09
 PIPE-FLOW(CFS) = 340.57
 PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 21.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.489
 SUBAREA AREA (ACRES) = 21.22 SUBAREA RUNOFF (CFS) = 19.27
 TOTAL AREA(ACRES) = 534.2 PEAK FLOW RATE(CFS) = 414.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 73.76
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.78
   HALFSTREET FLOOD WIDTH (FEET) = 32.11
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.70
 ** PEAK FLOW RATE TABLE **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
  1
          412.44 15.24 1.821 0.74(0.43) 0.58 329.8 20649.00
          414.33 21.30 1.489 0.74(0.43) 0.58 433.1 20640.00
          350.55 31.77 1.172 0.74(0.43) 0.58 525.6 20600.00
          335.38 33.79 1.129 0.74(0.43) 0.58 534.2 20620.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 414.33 Tc (MIN.) = 21.30
 AREA-AVERAGED Fm(INCH/HR) = 0.43 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.58 EFFECTIVE AREA(ACRES) = 433.08
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
_____
 PEAK FLOWRATE TABLE FILE NAME: 20658.DNA
_____
```

Date: 04/21/2014 File name: LR0206ZZ.RES

Page 48

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 534.2 TC (MIN.) = 21.30 EFFECTIVE AREA (ACRES) = 433.08 AREA-AVERAGED FM (INCH/HR) = 0.43

AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.576

PEAK FLOW RATE (CFS) = 414.33

\_\_\_\_\_

\_\_\_\_\_\_

END OF RATIONAL METHOD ANALYSIS

Date: 04/21/2014 File name: LR0206ZZ.RES Page 49 Date: 04/21/2014 File name: LR0206ZZ.RES Page 50 \*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20764

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0207ZZ.DAT

TIME/DATE OF STUDY: 08:00 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR

NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)	
===	=====	=======	=========	=====	=====	=====		======	
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180	
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180	

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS: AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20700.00 TO NODE 20701.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 906.02 ELEVATION DATA: UPSTREAM(FEET) = 2180.00 DOWNSTREAM(FEET) = 2130.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.204 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.190 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS Tc αp GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE NATURAL FAIR COVER "OPEN BRUSH" В 5.30 0.61 1.000 66 19.20 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.69 0.75 0.600 56 11.20 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.812 SUBAREA RUNOFF(CFS) = 14.86 9.99 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 14.86 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20701.00 TO NODE 20702.00 IS CODE = 92 \_\_\_\_\_\_ >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA \_\_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 2130.00 DOWNSTREAM NODE ELEVATION (FEET) = 2080.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 502.90 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250

File name: LR0207ZZ.RES

Page 2

Date: 04/21/2014

```
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.098
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                         56
 "3-4 DWELLINGS/ACRE" B 4.19
                                         0.75
                                                 0.600
 NATURAL FAIR COVER
                         B 2.38
 "OPEN BRUSH"
                                         0.61
                                                 1.000
                                                         66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"
                     в 0.08
                                       0.75 0.400
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.741
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 10.19
 AVERAGE FLOW DEPTH (FEET) = 0.47 FLOOD WIDTH (FEET) = 17.41
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 12.03
 SUBAREA AREA(ACRES) = 6.65
                                SUBAREA RUNOFF(CFS) = 9.53
 EFFECTIVE AREA(ACRES) = 16.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.78
                                 PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 16.6
                                                           23.57
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.49 FLOOD WIDTH (FEET) = 19.95
 FLOW VELOCITY (FEET/SEC.) = 10.12 DEPTH*VELOCITY (FT*FT/SEC) = 5.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20702.00 = 1408.92 FEET.
******************
 FLOW PROCESS FROM NODE 20702.00 TO NODE 20703.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
 UPSTREAM NODE ELEVATION (FEET) = 2080.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2075.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 222.67
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH (FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.026
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.10
                                      0.75
                                                 0.600
 NATURAL FAIR COVER
                        B 3.64 0.61
 "OPEN BRUSH"
                                               1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.854
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.38
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.09
 AVERAGE FLOW DEPTH(FEET) = 0.61 FLOOD WIDTH(FEET) = 33.39
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 12.76
```

```
EFFECTIVE AREA(ACRES) = 22.38 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.80
 TOTAL AREA(ACRES) = 22.4
                               PEAK FLOW RATE(CFS) =
                                                        30.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.62 FLOOD WIDTH(FEET) = 34.89
 FLOW VELOCITY (FEET/SEC.) = 5.18 DEPTH*VELOCITY (FT*FT/SEC) = 3.22
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20703.00 = 1631.59 FEET.
******************
 FLOW PROCESS FROM NODE 20703.00 TO NODE 20704.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2075.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2070.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 175.13
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.979
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 NATURAL FAIR COVER
                      В 0.53
 "OPEN BRUSH"
                                       0.61
                                              1.000
                                                      66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.24
                                       0.75
                                               0.400
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             2.09 0.75
                                              0.600
                                                      56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.04
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.77
 AVERAGE FLOW DEPTH(FEET) = 0.61 FLOOD WIDTH(FEET) = 33.99
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 13.26
 SUBAREA AREA(ACRES) = 2.86 SUBAREA RUNOFF(CFS) = 3.89
 EFFECTIVE AREA(ACRES) = 25.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.79
 TOTAL AREA (ACRES) = 25.2
                               PEAK FLOW RATE(CFS) =
                                                        33.04
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.62 FLOOD WIDTH (FEET) = 34.44
 FLOW VELOCITY (FEET/SEC.) = 5.82 DEPTH*VELOCITY (FT*FT/SEC) = 3.59
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20704.00 = 1806.72 FEET.
FLOW PROCESS FROM NODE 20704.00 TO NODE 20705.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
```

SUBAREA RUNOFF (CFS) = 7.60

SUBAREA AREA(ACRES) = 5.74

Date: 04/21/2014 File name: LR0207ZZ.RES Page 3 Date: 04/21/2014 File name: LR0207ZZ.RES Page 4

```
***STREET FLOWING FULL***
_____
 UPSTREAM NODE ELEVATION (FEET) = 2070.00
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 DOWNSTREAM NODE ELEVATION (FEET) = 2065.00
                                                                                  STREET FLOW DEPTH(FEET) = 0.58
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.79
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 22.10
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.32
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.52
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.19 Tc (MIN.) = 15.20
 MAXIMUM DEPTH(FEET) = 1.00
                                                                                 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.823
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.914
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fρ
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                                 Ap SCS
                                                                                     LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 NATURAL FAIR COVER
     LAND USE
 RESIDENTIAL
                                                                                 "OPEN BRUSH"
                                                                                                      В 3.14
                                                                                                                        0.61
                                                                                                                               1.000
 "8-10 DWELLINGS/ACRE" B 4.91
                                        0.75
                                                0.400
                                                      56
                                                                                 RESIDENTIAL
 RESIDENTIAL
                                                                                 "3-4 DWELLINGS/ACRE" B 0.43
                                                                                                                        0.75
                                                                                                                                0.600
                                                                                                                                        56
 "3-4 DWELLINGS/ACRE"
                    B 2.39
                                        0.75
                                                0.600
                                                                                 RESIDENTIAL
 NATURAL FAIR COVER
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                     В
                                                                                                             0.92
                                                                                                                       0.75 0.400
                                                                                                                                       56
 "OPEN BRUSH"
                        В
                           0.79 0.61 1.000 66
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.839
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.518
                                                                                 SUBAREA AREA(ACRES) = 4.49
                                                                                                              SUBAREA RUNOFF (CFS) = 5.21
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 38.64
                                                                                 EFFECTIVE AREA(ACRES) = 37.82 AREA-AVERAGED Fm(INCH/HR) = 0.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.24
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
 AVERAGE FLOW DEPTH (FEET) = 0.66 FLOOD WIDTH (FEET) = 39.82
                                                                                 TOTAL AREA(ACRES) = 37.8
                                                                                                               PEAK FLOW RATE(CFS) =
                                                                                                                                         45.26
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 14.01
 SUBAREA AREA(ACRES) = 8.09 SUBAREA RUNOFF(CFS) = 11.22
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 EFFECTIVE AREA(ACRES) = 33.33 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) =
                                                          42.79
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.04
                                                                                 FLOW VELOCITY (FEET/SEC.) = 4.33 DEPTH*VELOCITY (FT*FT/SEC.) = 2.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20706.00 = 2351.93 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                               ******************
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH (FEET) = 0.68 FLOOD WIDTH (FEET) = 41.76
                                                                                 FLOW PROCESS FROM NODE 20706.00 TO NODE 20707.00 IS CODE = 63
 FLOW VELOCITY (FEET/SEC.) = 5.32 DEPTH*VELOCITY (FT*FT/SEC) = 3.61
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20705.00 = 2043.51 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 FLOW PROCESS FROM NODE 20705.00 TO NODE 20706.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2055.00
______
                                                                                 STREET LENGTH (FEET) = 216.66 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 2065.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 308.42 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                  STREET FLOW DEPTH(FEET) = 0.56
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 20.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.40
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.90
```

Page 6

Page 5

Date: 04/21/2014

File name: LR0207ZZ.RES

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.72
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.74 Tc (MIN.) = 15.94
                                                                                 "2 DWELLINGS/ACRE"
                                                                                                        B 1.39
                                                                                                                        0.75
                                                                                                                                0.700
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.772
                                                                                 RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                        B 1.58 0.75 0.400
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                        Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.814
                                                                                 SUBAREA AREA (ACRES) = 7.33 SUBAREA RUNOFF (CFS) = 7.82
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE" B 0.78
                                        0.75 0.400 56
                                                                                 EFFECTIVE AREA(ACRES) = 45.93 AREA-AVERAGED Fm(INCH/HR) = 0.50
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
                                                                                 TOTAL AREA (ACRES) = 45.9 PEAK FLOW RATE (CFS) =
 SUBAREA AREA (ACRES) = 0.78 SUBAREA RUNOFF (CFS) = 1.03
 EFFECTIVE AREA(ACRES) = 38.60 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.38: 6HR = 1.95: 24HR = 4.03
                               PEAK FLOW RATE(CFS) =
 TOTAL AREA(ACRES) = 38.6
                                                         45.26
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 DEPTH (FEET) = 0.52 HALFSTREET FLOOD WIDTH (FEET) = 19.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 FLOW VELOCITY (FEET/SEC.) = 6.27 DEPTH*VELOCITY (FT*FT/SEC.) = 3.27
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                                 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20708.00 = 2906.50 FEET.
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.70
                                                                                 FLOW PROCESS FROM NODE 20708.00 TO NODE 20709.00 IS CODE = 63
                                                                               ______
 FLOW VELOCITY (FEET/SEC.) = 4.87 DEPTH*VELOCITY (FT*FT/SEC.) = 2.70
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20707.00 = 2568.59 FEET.
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 >>>> (STREET TABLE SECTION # 14 USED) <<<<
******************
                                                                               _____
 FLOW PROCESS FROM NODE 20707.00 TO NODE 20708.00 IS CODE = 63
                                                                                 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2035.00
-----
                                                                                 STREET LENGTH (FEET) = 377.00 CURB HEIGHT (INCHES) = 8.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                 STREET HALFWIDTH (FEET) = 39.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 UPSTREAM ELEVATION(FEET) = 2055.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
                                                                                 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 337.91 CURB HEIGHT (INCHES) = 6.0
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                   52.84
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  STREET FLOW DEPTH(FEET) = 0.83
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.72
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 41.41
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.41
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                49.17
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 1.43 Tc (MIN.) = 18.28
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.632
   STREET FLOW DEPTH(FEET) = 0.52
                                                                                 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
   HALFSTREET FLOOD WIDTH (FEET) = 18.99
                                                                                                                        Fρ
                                                                                                                                 αA
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.19
                                                                                     LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.22
                                                                                 RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 16.85
                                                                                                        B 0.45
                                                                                                                         0.75
                                                                                                                                0.700
                                                                                 "2 DWELLINGS/ACRE"
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.714
                                                                                 NATURAL FAIR COVER
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 "OPEN BRUSH"
                                                                                                        B 1.33
                                                                                                                         0.61
                                                                                                                                1.000
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                       SCS
                                                                                 RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 "8-10 DWELLINGS/ACRE"
                                                                                                               1.75
                                                                                                                         0.75
                                                                                                                                0.400
     LAND USE
 NATURAL FAIR COVER
                                                                                 RESIDENTIAL.
 "OPEN BRUSH"
                                4.36
                                        0.61
                                              1.000 66
                                                                                 "5-7 DWELLINGS/ACRE"
                                                                                                                1.06
                                                                                                                        0.75
                                                                                                                                0.500
```

Date: 04/21/2014

File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR0207ZZ.RES

56

50.36

56

66

56

Page 8

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.626
                                                                                   TOTAL AREA (ACRES) = 54.5 PEAK FLOW RATE (CFS) =
                                                                                                                                           53.31
 SUBAREA AREA(ACRES) = 4.59 SUBAREA RUNOFF(CFS) = 4.97
 EFFECTIVE AREA(ACRES) = 50.52 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 AREA-AVERAGED Fp(INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.73
                                                                                   5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 TOTAL AREA (ACRES) = 50.5 PEAK FLOW RATE (CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 40.00
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.67 DEPTH*VELOCITY (FT*FT/SEC.) = 3.79
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                                  LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20710.00 = 3610.46 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                 ******************
 DEPTH(FEET) = 0.82 HALFSTREET FLOOD WIDTH(FEET) = 40.94
 FLOW VELOCITY (FEET/SEC.) = 4.40 DEPTH*VELOCITY (FT*FT/SEC.) = 3.62
                                                                                   FLOW PROCESS FROM NODE 20710.00 TO NODE 20711.00 IS CODE = 63
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20709.00 = 3283.50 FEET.
                                                                                 ______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
*****************
                                                                                  >>>> (STREET TABLE SECTION # 14 USED) <<<<
 FLOW PROCESS FROM NODE 20709.00 TO NODE 20710.00 IS CODE = 63
                                                                                 _____
                                                                                  UPSTREAM ELEVATION(FEET) = 2030.00 DOWNSTREAM ELEVATION(FEET) = 2025.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET LENGTH (FEET) = 298.59 CURB HEIGHT (INCHES) = 8.0
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
                                                                                  STREET HALFWIDTH (FEET) = 39.00
______
 UPSTREAM ELEVATION(FEET) = 2035.00 DOWNSTREAM ELEVATION(FEET) = 2030.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 STREET LENGTH (FEET) = 326.96 CURB HEIGHT (INCHES) = 8.0
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 39.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.04
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                     55.93
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.06
                                                                                    STREET FLOW DEPTH (FEET) = 0.81
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 40.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.90
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.98
   STREET FLOW DEPTH(FEET) = 0.81
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 20.45
   HALFSTREET FLOOD WIDTH (FEET) = 40.16
                                                                                   * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.526
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.83
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                          Fρ
                                                                                                                                   αA
 STREET FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 19.44
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.573
                                                                                  RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                                  4.34
                                                                                                                           0.75
                                                                                                                                   0.700
                                                                                                                                           56
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                 Αp
                                                        SCS
                                                                                  NATURAL FAIR COVER
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   "OPEN BRUSH"
                                                                                                        в 0.10
                                                                                                                           0.61
                                                                                                                                  1.000
                                                                                                                                           66
 RESIDENTIAL
                                                                                  RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 0.82
                                         0.75
                                                 0.700
                                                       56
                                                                                  "8-10 DWELLINGS/ACRE"
                                                                                                                 0.27
                                                                                                                          0.75
                                                                                                                                  0.400
                                                                                                                                           56
 NATURAL FAIR COVER
                                                                                  RESIDENTIAL
 "OPEN BRUSH"
                                0.94
                                         0.61
                                                 1.000
                                                                                  "5-7 DWELLINGS/ACRE"
                                                                                                          В
                                                                                                                0.92
                                                                                                                          0.75 0.500
                                                         66
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 "8-10 DWELLINGS/ACRE" B
                                1.18
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.658
                                         0.75
                                                 0.400
 RESIDENTIAL
                                                                                  SUBAREA AREA (ACRES) = 5.63 SUBAREA RUNOFF (CFS) = 5.25
                                               0.500 56
 "5-7 DWELLINGS/ACRE"
                       В
                               1.02
                                         0.75
                                                                                  EFFECTIVE AREA (ACRES) = 60.11 AREA-AVERAGED Fm (INCH/HR) = 0.49
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.630
                                                                                  TOTAL AREA (ACRES) = 60.1 PEAK FLOW RATE (CFS) =
                                                                                                                                           56.23
 SUBAREA AREA (ACRES) = 3.96 SUBAREA RUNOFF (CFS) = 4.04
 EFFECTIVE AREA(ACRES) = 54.48 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014

File name: LR0207ZZ.RES

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                         TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 22.08
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20713.00 = 4560.55 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                        DEPTH(FEET) = 0.81 HALFSTREET FLOOD WIDTH(FEET) = 40.16
 FLOW VELOCITY (FEET/SEC.) = 4.90 DEPTH*VELOCITY (FT*FT/SEC.) = 3.99
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20713.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20711.00 = 3909.05 FEET.
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
******************
                                                                        _____
 FLOW PROCESS FROM NODE 20711.00 TO NODE 20712.00 IS CODE = 54
                                                                         MAINLINE Tc (MIN.) = 22.08
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.457
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
______
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 2025.00 DOWNSTREAM(FEET) = 2020.00
                                                                         RESIDENTIAL
                                                                                            В
 CHANNEL LENGTH THRU SUBAREA (FEET) = 279.66 CHANNEL SLOPE = 0.0179
                                                                         "2 DWELLINGS/ACRE"
                                                                                                     2.10
                                                                                                             0.75
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         NATURAL FAIR COVER
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "OPEN BRUSH"
                                                                                                     3.26
                                                                                                             0.61
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             56.23
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.43 FLOW DEPTH (FEET) = 1.35
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                            В 1.09
                                                                                                             0.75 0.500
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 21.31
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20712.00 = 4188.71 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.818
                                                                         SUBAREA AREA (ACRES) = 6.45 SUBAREA RUNOFF (CFS) = 5.30
********************
                                                                         EFFECTIVE AREA(ACRES) = 69.90 AREA-AVERAGED Fm(INCH/HR) = 0.49
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20712.00 IS CODE = 81
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.72
                                                                         TOTAL AREA(ACRES) = 69.9
                                                                                                      PEAK FLOW RATE(CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAINLINE Tc(MIN.) = 21.31
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.489
                                                                        SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                                                                         FLOW PROCESS FROM NODE 20713.00 TO NODE 20714.00 IS CODE = 54
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "2 DWELLINGS/ACRE"
                   В
                            2.62
                                    0.75
                                            0.700
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                        ______
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                   в 0.72 0.75
                                            0.500
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1960.00
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 732.38 CHANNEL SLOPE = 0.0546
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
                                                                         CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
 SUBAREA AREA(ACRES) = 3.34
                            SUBAREA RUNOFF (CFS) = 3.00
                                                                         MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
 EFFECTIVE AREA(ACRES) = 63.45 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                     60.74
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.71
                                                                         FLOW VELOCITY (FEET/SEC.) = 8.30 FLOW DEPTH (FEET) = 1.03
                                                                         TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 23.55
 TOTAL AREA (ACRES) = 63.5
                            PEAK FLOW RATE(CFS) =
                                                   57.22
                                                                         LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20714.00 = 5292.93 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        ******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                         FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 81
*****************
                                                                        ______
 FLOW PROCESS FROM NODE 20712.00 TO NODE 20713.00 IS CODE = 54
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        _____
                                                                         MAINLINE Tc(MIN.) = 23.55
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.402
_____
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 2000.00
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fρ
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.84 CHANNEL SLOPE = 0.0538
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             LAND USE
 CHANNEL BASE (FEET) = 5.00 "Z" FACTOR = 2.000
                                                                         NATURAL FAIR COVER
                                                                                                   2.63
                                                                                                             0.61
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.50
                                                                         "OPEN BRUSH"
                                                                                              В
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            57.22
                                                                         RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 8.07 FLOW DEPTH (FEET) = 1.01
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                                     1.94
                                                                                                             0.75
```

File name: LR0207ZZ.RES

Date: 04/21/2014

SCS

56

66

0.700

1.000

Αp

1.000

0.500

66

56

Page 12

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.788
 SUBAREA AREA(ACRES) = 4.57
                             SUBAREA RUNOFF(CFS) = 3.66
 EFFECTIVE AREA(ACRES) = 74.47 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.73
 TOTAL AREA (ACRES) = 74.5 PEAK FLOW RATE (CFS) =
                                                     60.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*****************
 FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
______
 FLOW PROCESS FROM NODE 20718.00 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.44
 ELEVATION DATA: UPSTREAM(FEET) = 2125.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.738
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.542
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Αр
                                                    SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              0.21
                                      0.75
                                              0.600
                                                    56 8.74
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             1.38
                                      0.61
                                             1.000
                                                    66 14.97
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            5.85
                                      0.75
                                             0.700
                                                    56 9.29
                     В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.753
 SUBAREA RUNOFF (CFS) = 13.42
 TOTAL AREA (ACRES) = 7.44 PEAK FLOW RATE (CFS) = 13.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
********************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.74
 RAINFALL INTENSITY (INCH/HR) = 2.54
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 7.44
```

```
13.42
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
FLOW PROCESS FROM NODE 20718.50 TO NODE 20719.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 522.86
 ELEVATION DATA: UPSTREAM(FEET) = 2100.00 DOWNSTREAM(FEET) = 2040.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.768
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.728
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                             Αp
                                                   SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.21
                                     0.75
                                             0.600
                                                    56
                                                       7.77
 NATURAL FAIR COVER
 "OPEN BRUSH"
                             2.34
                                      0.61
                                            1.000
                                                    66 13.31
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           4.69
                                     0.75 0.700
                                                        8.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.794
 SUBAREA RUNOFF(CFS) = 14.19
 TOTAL AREA (ACRES) = 7.24 PEAK FLOW RATE (CFS) = 14.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20719.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 7.77
 RAINFALL INTENSITY (INCH/HR) = 2.73
 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.79
 EFFECTIVE STREAM AREA(ACRES) = 7.24
 TOTAL STREAM AREA(ACRES) = 7.24
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               14.19
 ** CONFLUENCE DATA **
  STREAM
           Q Tc Intensity Fp(Fm)
                                        Ар Ае
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                            (ACRES) NODE
  1
          13.42 8.74 2.542 0.71(0.54)0.75 7.4 20718.00
          14.19 7.77 2.728 0.69(0.55) 0.79
                                                7.2 20718.50
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
```

Page 14

TOTAL STREAM AREA(ACRES) = 7.44

```
** PEAK FLOW RATE TABLE **
  STREAM
                 Tc Intensity Fp(Fm)
                                        Ap Ae
           0
                                                   HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          27.22 7.77 2.728 0.70(0.54) 0.77 13.9 20718.50
           26.39 8.74 2.542 0.70(0.54) 0.77 14.7 20718.00
    2
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 27.22 Tc (MIN.) =
 EFFECTIVE AREA(ACRES) =
                     13.85 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.77
 TOTAL AREA (ACRES) = 14.7
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20719.00 = 714.44 FEET.
******************
 FLOW PROCESS FROM NODE 20719.00 TO NODE 20722.00 IS CODE = 92
______
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
______
 UPSTREAM NODE ELEVATION (FEET) = 2040.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 351.50
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.595
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 5.48 0.75
                                            0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 32.33
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.67
 AVERAGE FLOW DEPTH(FEET) = 0.55 FLOOD WIDTH(FEET) = 26.97
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.68 Tc (MIN.) = 8.44
 SUBAREA AREA(ACRES) = 5.48 SUBAREA RUNOFF(CFS) = 10.21
 EFFECTIVE AREA(ACRES) = 19.33 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.75
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) =
                                                     35.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) = 0.57 FLOOD WIDTH(FEET) = 28.47
 FLOW VELOCITY (FEET/SEC.) = 8.77 DEPTH*VELOCITY (FT*FT/SEC) = 4.97
 LONGEST FLOWPATH FROM NODE 20718.00 TO NODE 20722.00 = 1065.94 FEET.
******************
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 8.44
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.75
 EFFECTIVE STREAM AREA(ACRES) = 19.33
 TOTAL STREAM AREA(ACRES) = 20.16
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                   35.77
*****************
 FLOW PROCESS FROM NODE 20720.00 TO NODE 20721.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1046.89
 ELEVATION DATA: UPSTREAM(FEET) = 2105.00 DOWNSTREAM(FEET) = 2020.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.682
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.135
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 5.65 0.75 0.700
                                                      56 11.68
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF (CFS) = 8.20
 TOTAL AREA(ACRES) = 5.65 PEAK FLOW RATE(CFS) =
                                                  8.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*******************
 FLOW PROCESS FROM NODE 20721.00 TO NODE 20722.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
_____
 UPSTREAM NODE ELEVATION (FEET) = 2020.00
 DOWNSTREAM NODE ELEVATION (FEET) = 2015.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 115.32
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
 MAXIMUM DEPTH(FEET) = 1.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.105
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.32
                                       0.75
                                              0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       В
                             4.12
                                       0.61 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.927
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.78
 AVERAGE FLOW DEPTH(FEET) = 0.46 FLOOD WIDTH(FEET) = 16.22
```

Page 16

RAINFALL INTENSITY (INCH/HR) = 2.59

```
"V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 11.97
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 SUBAREA AREA(ACRES) = 5.44
                             SUBAREA RUNOFF(CFS) = 7.41
                                                                           ______
 EFFECTIVE AREA(ACRES) = 11.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2015.00
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.81
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 2000.00
 TOTAL AREA (ACRES) = 11.1 PEAK FLOW RATE (CFS) =
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 664.99
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH (FEET) = 1.00
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.296
 DEPTH(FEET) = 0.49 FLOOD WIDTH(FEET) = 19.95
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 FLOW VELOCITY (FEET/SEC.) = 6.63 DEPTH*VELOCITY (FT*FT/SEC) = 3.28
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                               SCS
                                                                                LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            RESIDENTIAL
******************
                                                                            "2 DWELLINGS/ACRE" B 5.92
                                                                                                                 0.75 0.700
                                                                                                                                56
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20722.00 IS CODE = 1
                                                                            NATURAL FAIR COVER
______
                                                                            "OPEN BRUSH"
                                                                                                В
                                                                                                      5.87 0.61 1.000
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.849
_____
                                                                            TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 59.27
 TOTAL NUMBER OF STREAMS = 2
                                                                            TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.81
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                            AVERAGE FLOW DEPTH(FEET) = 0.73 FLOOD WIDTH(FEET) = 47.43
                                                                            "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.91 Tc (MIN.) = 10.35
 TIME OF CONCENTRATION (MIN.) = 11.97
 RAINFALL INTENSITY (INCH/HR) = 2.10
                                                                            SUBAREA AREA(ACRES) = 11.79 SUBAREA RUNOFF(CFS) = 18.33
 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                            EFFECTIVE AREA(ACRES) = 38.95 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.79
 AREA-AVERAGED Fp(INCH/HR) = 0.69
                                                                            TOTAL AREA (ACRES) = 43.0 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Ap = 0.81
 EFFECTIVE STREAM AREA(ACRES) = 11.09
 TOTAL STREAM AREA(ACRES) = 11.09
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 15.45
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 ** CONFLUENCE DATA **
                                                                            END OF SUBAREA "V" GUTTER HYDRAULICS:
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
                                                                            DEPTH(FEET) = 0.73 FLOOD WIDTH(FEET) = 48.03
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                            FLOW VELOCITY (FEET/SEC.) = 5.86 DEPTH*VELOCITY (FT*FT/SEC) = 4.29
          35.77 8.44 2.595 0.72(0.54)0.75 19.3 20718.50
    1
                                                                            LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20723.00 = 1827.20 FEET.
          34.32 9.41 2.431 0.72(0.54) 0.75 20.2 20718.00
    1
                                                                           ******************
    2
          15.45 11.97 2.105 0.69(0.56) 0.81 11.1 20720.00
                                                                            FLOW PROCESS FROM NODE 20723.00 TO NODE 20724.00 IS CODE = 92
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                           ______
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                            >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                           _____
 ** PEAK FLOW RATE TABLE **
                                                                            UPSTREAM NODE ELEVATION (FEET) = 2000.00
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 1960.00
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 791.28
          50.12 8.44 2.595 0.71(0.54)0.77 27.2 20718.50
   1
                                                                            "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
          49.04 9.41 2.431 0.71(0.54)0.77 28.9 20718.00
                                                                            PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
          43.86 11.97 2.105 0.70(0.55) 0.77 31.2 20720.00
                                                                            PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                            MAXIMUM DEPTH(FEET) = 1.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.107
 PEAK FLOW RATE (CFS) = 50.12 Tc (MIN.) = 8.44
                                                                            SUBAREA LOSS RATE DATA(AMC II):
 EFFECTIVE AREA(ACRES) = 27.16 AREA-AVERAGED Fm(INCH/HR) = 0.54
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fр
 AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.77
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
 TOTAL AREA(ACRES) = 31.2
                                                                            NATURAL FAIR COVER
                                                                                               B 9.77 0.61 1.000
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20722.00 = 1162.21 FEET.
                                                                            "OPEN BRUSH"
                                                                                                                               66
                                                                            RESIDENTIAL
******************
                                                                            "5-7 DWELLINGS/ACRE" B 0.38 0.75 0.500
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 FLOW PROCESS FROM NODE 20722.00 TO NODE 20723.00 IS CODE = 92
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.981
```

Page 18

```
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 8.29
                                                                       *************************
 AVERAGE FLOW DEPTH (FEET) = 0.68 FLOOD WIDTH (FEET) = 42.21
                                                                        FLOW PROCESS FROM NODE 20724.00 TO NODE 20725.00 IS CODE = 31
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 11.94
 SUBAREA AREA(ACRES) = 10.15
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                            SUBAREA RUNOFF (CFS) = 13.72
 EFFECTIVE AREA(ACRES) = 49.10 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                        >>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW) <>>>
 AREA-AVERAGED Fp (INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.83
                                                                        ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1958.00
 TOTAL AREA (ACRES) =
                 53.2
                            PEAK FLOW RATE(CFS) =
                                                    68.27
                                                                        FLOW LENGTH (FEET) = 81.40 MANNING'S N = 0.013
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.7 INCHES
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                        PIPE-FLOW VELOCITY (FEET/SEC.) = 16.95
                                                                        ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                        PIPE-FLOW(CFS) = 123.13
                                                                        PIPE TRAVEL TIME (MIN.) = 0.08 Tc (MIN.) = 12.02
 DEPTH (FEET) = 0.68 FLOOD WIDTH (FEET) = 42.21
 FLOW VELOCITY (FEET/SEC.) = 8.32 DEPTH*VELOCITY (FT*FT/SEC) = 5.68
                                                                        LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20725.00 = 5374.33 FEET.
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 2618.48 FEET.
                                                                       *******************
FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 10
 FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 11
.....
                                                                        >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
                                                                       *******************
 ** MAIN STREAM CONFLUENCE DATA **
                                                                        FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 15.1
  STREAM
          Q
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                        >>>>DEFINE MEMORY BANK # 2 <<<<
          68.27 11.94 2.107 0.68(0.56)0.83 49.1 20718.50
   1
                                                                       ______
          66.18 12.93 2.009 0.68 (0.56) 0.83 50.8 20718.00
                                                                        PEAK FLOWRATE TABLE FILE NAME: 20658.DNA
                      1.798 0.68(0.56)0.83 53.2 20720.00
    3
          59.19 15.56
                                                                        MEMORY BANK # 2 DEFINED AS FOLLOWS:
 LONGEST FLOWPATH FROM NODE 20720.00 TO NODE 20724.00 = 2618.48 FEET.
                                                                                Q Tc Fp(Fm) Ap Ae HEADWATER
                                                                                 (CFS) (MIN.) (INCH/HR) (ACRES) NODE
                                                                        NUMBER
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                          1
                                                                                412.44 15.24 0.74(0.43) 0.58 329.8 20649.00
                                      Ap Ae HEADWATER
                                                                                                           433.1 20640.00
  STREAM
         0
               Tc Intensity Fp(Fm)
                                                                                414.33 21.30 0.74(0.43) 0.58
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                350.55 31.77 0.74(0.43)0.58
                                                                                                           525.6 20600.00
  1
          60.92 23.55 1.402 0.68(0.49) 0.73 74.5 20700.00
                                                                                335.38 33.79 0.74(0.43) 0.58
                                                                                                           534.2 20620.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
                                                                         TOTAL AREA(ACRES) =
                                                                                             534.2
                                                                        LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
 ** PEAK FLOW RATE TABLE **
                                                                       ******************
  STREAM
          0
               Tc Intensity Fp(Fm)
                                         Ae
                                                 HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                          (ACRES) NODE
                                                                        FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 14.0
   1
         123.13 11.94 2.107 0.68 ( 0.53) 0.79
                                           86.9 20718.50
         121.97 12.93 2.009 0.68(0.53)0.79
                                           91.7 20718.00
                                                                        >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
         116.97 15.56 1.798 0.68(0.53) 0.78
                                           102.4 20720.00
                                                                       ______
         101.15 23.55 1.402 0.68(0.52)0.77
                                           127.7 20700.00
                      127.7
  TOTAL AREA (ACRES) =
                                                                        MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
                                                                         STREAM
                                                                                  0
                                                                                       Tc
                                                                                             Fp(Fm) Ap
                                                                                                          Аe
                                                                                                                 HEADWATER
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                                 (CFS) (MIN.) (INCH/HR) (ACRES) NODE
                                                                                                           329.8 20649.00
                                                                         1
 PEAK FLOW RATE (CFS) = 123.13 Tc (MIN.) = 11.942
                                                                                412.44 15.24 0.74(0.43) 0.58
                                                                          2
                                                                                                            433.1 20640.00
 EFFECTIVE AREA(ACRES) = 86.86 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                                414.33 21.30 0.74(0.43) 0.58
 AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.79
                                                                                350.55 31.77 0.74(0.43) 0.58
                                                                                                            525.6 20600.00
 TOTAL AREA(ACRES) = 127.7
                                                                                 335.38 33.79 0.74(0.43) 0.58
                                                                                                            534.2 20620.00
 LONGEST FLOWPATH FROM NODE 20700.00 TO NODE 20724.00 = 5292.93 FEET.
                                                                         TOTAL AREA(ACRES) =
                                                                                             534.2
                                                                        LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20658.00 = 7681.94 FEET.
******************
 FLOW PROCESS FROM NODE 20724.00 TO NODE 20724.00 IS CODE = 12
                                                                       FLOW PROCESS FROM NODE 20658.00 TO NODE 20658.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                        >>>>CLEAR MEMORY BANK # 2 <<<<
```

Date: 04/21/2014 File name: LR0207ZZ.RES

```
______
FLOW PROCESS FROM NODE 20658.00 TO NODE 20725.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2000.00 DOWNSTREAM ELEVATION(FEET) = 1958.00
 STREET LENGTH (FEET) = 941.91 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 422.38
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 1.00
   HALFSTREET FLOOD WIDTH (FEET) = 43.22
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 11.09
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 11.14
 STREET FLOW TRAVEL TIME (MIN.) = 1.42 Tc (MIN.) = 22.72
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.433
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                               αA
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 2.46
                                       0.75
                                               0.500
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 5.48
                                       0.75
                                               0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                       B 12.20
                                       0.61
                                               1.000
                                                      66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.32
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.853
 SUBAREA AREA (ACRES) = 20.46 SUBAREA RUNOFF (CFS) = 16.10
 EFFECTIVE AREA(ACRES) = 453.54 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.59
 TOTAL AREA(ACRES) = 554.7 PEAK FLOW RATE(CFS) = 414.33
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.00 HALFSTREET FLOOD WIDTH(FEET) = 42.85
 FLOW VELOCITY (FEET/SEC.) = 11.06 DEPTH*VELOCITY (FT*FT/SEC.) = 11.03
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
```

File name: LR0207ZZ.RES

Page 21

Date: 04/21/2014

```
THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
 ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.05
 PIPE-FLOW(CFS) =
                  382.89
 PIPEFLOW TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 21.96
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.462
 SUBAREA AREA(ACRES) = 20.46
                            SUBAREA RUNOFF (CFS) = 16.65
 TOTAL AREA (ACRES) = 554.7
                               PEAK FLOW RATE (CFS) = 420.56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 37.68
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.49
  HALFSTREET FLOOD WIDTH (FEET) = 18.00
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.59
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.72
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
          421.42 15.89 1.776 0.73(0.44) 0.60
                                                350.3 20649.00
          420.56 21.96 1.462 0.73(0.43)0.59
                                                453.5 20640.00
          355.68 32.34 1.159 0.73(0.44)0.59 546.1 20600.00
          340.17 34.37 1.118 0.73 ( 0.44 ) 0.59
                                                 554.7 20620.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 421.42 Tc (MIN.) = 15.89
 AREA-AVERAGED Fm(INCH/HR) = 0.44 AREA-AVERAGED Fp(INCH/HR) = 0.73
 AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA(ACRES) = 350.29
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
******************
 FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 11
______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
 ** MAIN STREAM CONFLUENCE DATA **
 STREAM
            Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
  1
          421.42 15.89 1.776 0.73 (0.44) 0.60 350.3 20649.00
          420.56 21.96 1.462 0.73(0.43) 0.59 453.5 20640.00
          355.68 32.34 1.159 0.73(0.44) 0.59 546.1 20600.00
          340.17 34.37 1.118 0.73(0.44)0.59
                                                554.7 20620.00
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
          0
                Tc Intensity Fp(Fm) Ap Ae
                                                      HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                               (ACRES) NODE
    1
          123.13 12.02 2.099 0.68 ( 0.53) 0.79 86.9 20718.50
    2
          121.97 13.01 2.001 0.68(0.53) 0.79
                                              91.7 20718.00
          116.97 15.64 1.793 0.68 (0.53) 0.78 102.4 20720.00
          101.15 23.63 1.399 0.68(0.52) 0.77
                                                 127.7 20700.00
```

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 22

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 71 \_\_\_\_\_

>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<

>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH< \_\_\_\_\_

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02

S-GRAPH: VALLEY(DEV.) = 77.8%; VALLEY(UNDEV.) / DESERT = 22.2%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.45; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;

3HR = 1.00; 6HR = 1.00; 24HR = 1.00

UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 682.3

LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20725.00 = 8623.85 FEET.

EOUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0533; Lca/L=0.4,n=.0478; Lca/L=0.5,n=.0439; Lca/L=0.6,n=.0409

TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 112.03

UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 488.17

TOTAL PEAK FLOW RATE (CFS) = 488.17 (SOURCE FLOW INCLUDED)

RATIONAL METHOD PEAK FLOW RATE (CFS) = 537.89

(UPSTREAM NODE PEAK FLOW RATE(CFS) = 537.89)

PEAK FLOW RATE (CFS) USED = 537.89

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20725.00 TO NODE 20725.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<

\_\_\_\_\_ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 20725.00 TO NODE 20726.00 IS CODE = 54

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

CHANNEL FLOW THRU SUBAREA(CFS) = 537.89 FLOW VELOCITY (FEET/SEC.) = 28.83 FLOW DEPTH (FEET) = 1.90 TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 35.19LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20726.00 TO NODE 20726.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc(MIN.) = 35.19\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.102 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "5-7 DWELLINGS/ACRE" В 3.96 0.75 0.500 RESIDENTIAL "2 DWELLINGS/ACRE" R 4.31 0.75 0.700 NATURAL FAIR COVER "OPEN BRUSH" 1.000 В 14.46 0.61 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.98 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.845 SUBAREA AREA(ACRES) = 23.71 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02 S-GRAPH: VALLEY(DEV.) = 76.5%; VALLEY(UNDEV.) / DESERT = 23.5% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.46; Ybar = 0.55 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; 3HR = 1.00; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 706.0 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20726.00 = 10044.86 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0501; Lca/L=0.4,n=.0449; Lca/L=0.5,n=.0413; Lca/L=0.6,n=.0385 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 115.08 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 492.56 PEAK FLOW RATE(CFS) = 537.89 TOTAL AREA(ACRES) = 706.0 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03FLOW PROCESS FROM NODE 20726.00 TO NODE 20727.00 IS CODE = 54 \_\_\_\_\_\_ >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1872.00 DOWNSTREAM(FEET) = 1835.00

File name: LR020777.RFS

Date: 04/21/2014

\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1958.00 DOWNSTREAM(FEET) = 1872.00

SCS

56

56

66

56

Page 24

CHANNEL LENGTH THRU SUBAREA (FEET) = 1421.01 CHANNEL SLOPE = 0.0605

CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000

MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 760.88 CHANNEL SLOPE = 0.0486
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 537.89
 FLOW VELOCITY (FEET/SEC.) = 26.68 FLOW DEPTH (FEET) = 2.01
 TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 35.66
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET.
FLOW PROCESS FROM NODE 20727.00 TO NODE 20727.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 35.66
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.093
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
                                      Fр
                                               Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                              1.92
                                       0.75
                                               0.500
                                                      56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                               6.30
                                       0.75
                                               0.700
                                                      56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                              12.35
                                       0.61
                                              1.000
                                                      66
 RESIDENTIAL
                             0.34
 "3-4 DWELLINGS/ACRE"
                    В
                                       0.75
                                               0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
 SUBAREA AREA(ACRES) = 20.91
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
 S-GRAPH: VALLEY (DEV.) = 75.4%; VALLEY (UNDEV.) / DESERT= 24.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.59; LAG(HR) = 0.48; Fm(INCH/HR) = 0.46; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 726.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20727.00 = 10805.74 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0484; Lca/L=0.4,n=.0434; Lca/L=0.5,n=.0398; Lca/L=0.6,n=.0372
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 117.68
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 497.32
 TOTAL AREA (ACRES) = 726.9
                             PEAK FLOW RATE (CFS) = 537.89
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20727.00 TO NODE 20728.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1835.00 DOWNSTREAM(FEET) = 1820.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 832.56 CHANNEL SLOPE = 0.0180
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
```

```
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                537.89
 FLOW VELOCITY (FEET/SEC.) = 18.22 FLOW DEPTH (FEET) = 2.33
 TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 36.43
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET.
***********************
 FLOW PROCESS FROM NODE 20728.00 TO NODE 20728.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 36.43
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.079
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                       Fр
                                                      SCS
                                                Αр
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                      В
                             3.88
                                        0.75
                                               0.500
                                                       56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                        В 12.91
                                        0.75
                                               0.700
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                               6.79
                                        0.75
                                               0.600
                                                       56
 NATURAL FAIR COVER
 "OPEN BRUSH"
                        В
                               2.42
                                        0.61 1.000
                                                       66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AREA (ACRES) = 26.00
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
 S-GRAPH: VALLEY (DEV.) = 76.0%; VALLEY (UNDEV.) / DESERT = 24.0%
        MOUNTAIN= 0.0\%; FOOTHILL= 0.0\%; DESERT (UNDEV.) = 0.0\%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.46; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 752.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20728.00 = 11638.30 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0464; Lca/L=0.4,n=.0416; Lca/L=0.5,n=.0382; Lca/L=0.6,n=.0357
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 121.61
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 502.61
 TOTAL AREA (ACRES) = 752.9
                                PEAK FLOW RATE(CFS) =
                                                      537.89
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20728.00 TO NODE 20748.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1820.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 259.80 CHANNEL SLOPE = 0.0192
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
```

File name: LR020777.RFS

Page 26

Date: 04/21/2014

```
FLOW VELOCITY (FEET/SEC.) = 18.65 FLOW DEPTH (FEET) = 2.29
 TRAVEL TIME (MIN.) = 0.23 Tc (MIN.) = 36.66
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
*******************
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 36.66
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.075
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                           0.70 0.75 0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 SUBAREA AREA(ACRES) = 0.70
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
 S-GRAPH: VALLEY (DEV.) = 76.0%; VALLEY (UNDEV.) / DESERT = 24.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.46; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 753.6
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0459; Lca/L=0.4,n=.0411; Lca/L=0.5,n=.0378; Lca/L=0.6,n=.0352
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 121.74
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 499.71
 TOTAL AREA (ACRES) = 753.6
                           PEAK FLOW RATE (CFS) = 537.89
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*********************
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 537.89 Tc (MIN.) = 36.66
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.55
 TOTAL AREA (ACRES) =
                     753.6
******************
 FLOW PROCESS FROM NODE 20730.00 TO NODE 20731.00 IS CODE = 21
...........
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 428.13
 ELEVATION DATA: UPSTREAM(FEET) = 1955.00 DOWNSTREAM(FEET) = 1935.00
```

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 8.104
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.659
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 NATURAL FAIR COVER
 "OPEN BRUSH"
                      B 1.49
                                      0.61
                                            1.000
                                                     66 14.71
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 2.96 0.75 0.500
                                                    56 8.10
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.667
 SUBAREA RUNOFF (CFS) = 8.83
 TOTAL AREA (ACRES) = 4.45 PEAK FLOW RATE (CFS) =
                                                8.83
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20731.00 TO NODE 20732.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1935.00 DOWNSTREAM(FEET) = 1890.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 975.64 CHANNEL SLOPE = 0.0461
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               8.83
 FLOW VELOCITY (FEET/SEC.) = 8.35 FLOW DEPTH (FEET) = 0.29
 TRAVEL TIME (MIN.) = 1.95 Tc (MIN.) = 10.05
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20732.00 = 1403.77 FEET.
*******************
 FLOW PROCESS FROM NODE 20732.00 TO NODE 20732.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 10.05
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.337
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Дp
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 NATURAL FAIR COVER
                     в 5.96
                                      0.61 1.000
 "OPEN BRUSH"
                                                    66
 RESIDENTIAL
                           5.56 0.75 0.500
 "5-7 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.759
 SUBAREA AREA(ACRES) = 11.52
                             SUBAREA RUNOFF (CFS) = 19.06
 EFFECTIVE AREA(ACRES) = 15.97 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 16.0
                              PEAK FLOW RATE(CFS) =
                                                     26.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
```

File name: LR020777.RFS

Date: 04/21/2014

Date: 04/21/2014 File name: LR0207ZZ.RES Page 27

Page 28

```
******************
 FLOW PROCESS FROM NODE 20732.00 TO NODE 20733.00 IS CODE = 54
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         _____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                          MAINLINE Tc(MIN.) = 12.35
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                          * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
_____
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1890.00 DOWNSTREAM(FEET) = 1845.00
                                                                           DEVELOPMENT TYPE/
                                                                                             SCS SOIL AREA
                                                                                                              Fρ
                                                                                                                      Дp
 CHANNEL LENGTH THRU SUBAREA(FEET) = 862.28 CHANNEL SLOPE = 0.0522
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
                                                                          RESIDENTIAL
                                                                                                   41.76
                                                                                                                     0.700
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.00
                                                                          "2 DWELLINGS/ACRE"
                                                                                               В
                                                                                                              0.75
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             26.60
                                                                          RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 12.33 FLOW DEPTH (FEET) = 0.53
                                                                          "3-4 DWELLINGS/ACRE"
                                                                                                    0.84
                                                                                                                     0.600
                                                                                               B
                                                                                                              0.75
 TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 11.22
                                                                          RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20733.00 = 2266.05 FEET.
                                                                          "5-7 DWELLINGS/ACRE"
                                                                                                      4.95
                                                                                                                      0.500
                                                                                               B
                                                                                                              0.75
                                                                          NATURAL FAIR COVER
******************
                                                                                                     17.32
                                                                          "OPEN BRUSH"
                                                                                               В
                                                                                                              0.61
                                                                                                                   1.000
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20733.00 IS CODE = 81
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.70
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.764
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          SUBAREA AREA(ACRES) = 64.87
                                                                                                     SUBAREA RUNOFF(CFS) = 89.33
_____
                                                                          EFFECTIVE AREA(ACRES) = 94.59 AREA-AVERAGED Fm(INCH/HR) = 0.52
 MAINLINE Tc(MIN.) = 11.22
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.76
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.188
                                                                          TOTAL AREA (ACRES) = 94.6
                                                                                                       PEAK FLOW RATE(CFS) =
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                             Αp
                                                   SCS
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 RESIDENTIAL
                                                                         ***********************
                                            0.700
 "2 DWELLINGS/ACRE"
                      В
                             0.59
                                     0.75
                                                  56
 NATURAL FAIR COVER
                                                                          FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
 "OPEN BRUSH"
                             7.70
                                            1.000
                                     0.61
                                                   66
 RESIDENTIAL
                                                                          >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                         ______
                             5.46
 "5-7 DWELLINGS/ACRE"
                      В
                                     0.75
                                            0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.65
                                                                          TOTAL NUMBER OF STREAMS = 3
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.789
                                                                          CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 SUBAREA AREA (ACRES) = 13.75
                                                                          TIME OF CONCENTRATION (MIN.) = 12.35
                            SUBAREA RUNOFF (CFS) = 20.71
 EFFECTIVE AREA(ACRES) = 29.72 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                          RAINFALL INTENSITY (INCH/HR) = 2.07
 AREA-AVERAGED Fp (INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.76
                                                                          AREA-AVERAGED Fm(INCH/HR) = 0.52
 TOTAL AREA (ACRES) =
                  29.7
                            PEAK FLOW RATE (CFS) =
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.69
                                                    45.17
                                                                          AREA-AVERAGED Ap = 0.76
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          EFFECTIVE STREAM AREA(ACRES) =
                                                                                                    94.59
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                          TOTAL STREAM AREA(ACRES) =
                                                                                                   94.59
                                                                          PEAK FLOW RATE (CFS) AT CONFLUENCE = 131.23
******************
                                                                         ********************
 FLOW PROCESS FROM NODE 20733.00 TO NODE 20748.00 IS CODE = 54
                                                                          FLOW PROCESS FROM NODE 20740.00 TO NODE 20741.00 IS CODE = 21
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         ______
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                          >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
______
                                                                          >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 ELEVATION DATA: UPSTREAM(FEET) = 1845.00 DOWNSTREAM(FEET) = 1815.00
                                                                         ______
 CHANNEL LENGTH THRU SUBAREA (FEET) = 848.95 CHANNEL SLOPE = 0.0353
                                                                          INITIAL SUBAREA FLOW-LENGTH (FEET) = 714.40
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 2095.00 DOWNSTREAM(FEET) = 2070.00
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                          Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                             45.17
 FLOW VELOCITY (FEET/SEC.) = 12.51 FLOW DEPTH (FEET) = 0.79
                                                                          SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.865
 TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 12.35
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.116
 LONGEST FLOWPATH FROM NODE 20730.00 TO NODE 20748.00 = 3115.00 FEET.
                                                                          SUBAREA TC AND LOSS RATE DATA(AMC II):
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fρ
*******************
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
                                                                          RESIDENTIAL
      Date: 04/21/2014
```

File name: LR020777.RFS

Date: 04/21/2014 File name: LR020777.RFS Page 30

SCS

56

56

56

```
"2 DWELLINGS/ACRE"
                     B 7.73 0.75 0.700 56 11.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA RUNOFF(CFS) = 11.08
 TOTAL AREA (ACRES) = 7.73 PEAK FLOW RATE (CFS) = 11.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*******************
 FLOW PROCESS FROM NODE 20741.00 TO NODE 20742.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2070.00 DOWNSTREAM(FEET) = 2035.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 418.24 CHANNEL SLOPE = 0.0837
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 0.05
       ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
          CAPACITY ( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
          ALLOWABLE DEPTH).
          AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
          ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.
 *GIVEN HEIGHT (FEET) = 0.05 ESTIMATED CHANNEL BASE (FEET) = 203.62
 CHANNEL FLOW THRU SUBAREA(CFS) = 11.08
 FLOW VELOCITY (FEET/SEC.) = 1.21 FLOW DEPTH (FEET) = 0.05
 TRAVEL TIME (MIN.) = 0.00 Tc (MIN.) = 11.87
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20742.00 = 1132.64 FEET.
******************
 FLOW PROCESS FROM NODE 20742.00 TO NODE 20742.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 11.87
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.115
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     В
                            4.91
                                    0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 4.91
                            SUBAREA RUNOFF (CFS) = 7.03
 EFFECTIVE AREA(ACRES) = 12.64 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 12.6 PEAK FLOW RATE (CFS) = 18.11
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
FLOW PROCESS FROM NODE 20742.00 TO NODE 20743.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

```
ELEVATION DATA: UPSTREAM(FEET) = 2035.00 DOWNSTREAM(FEET) = 2020.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 525.35 CHANNEL SLOPE = 0.0286
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 18.11
 FLOW VELOCITY (FEET/SEC.) = 4.05 FLOW DEPTH (FEET) = 1.34
 TRAVEL TIME (MIN.) = 2.16 Tc (MIN.) = 14.03
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20743.00 = 1657.99 FEET.
******************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20743.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 14.03
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.913
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                 Fρ
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                          7.69 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 7.69
                            SUBAREA RUNOFF (CFS) = 9.62
 EFFECTIVE AREA(ACRES) = 20.33 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 20.3 PEAK FLOW RATE (CFS) =
                                                  25.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20743.00 TO NODE 20744.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2020.00 DOWNSTREAM(FEET) = 1970.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 496.30 CHANNEL SLOPE = 0.1007
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            25.42
 FLOW VELOCITY (FEET/SEC.) = 7.12 FLOW DEPTH (FEET) = 1.19
 TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 15.19
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20744.00 = 2154.29 FEET.
FLOW PROCESS FROM NODE 20744.00 TO NODE 20744.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 15.19
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.824
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                 Fp
                                                  SCS
                                          Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      Date: 04/21/2014 File name: LR0207ZZ.RES
```

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

```
RESIDENTIAL
 "2 DWELLINGS/ACRE"
                B 6.02 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA (ACRES) = 6.02 SUBAREA RUNOFF (CFS) = 7.04
 EFFECTIVE AREA(ACRES) = 26.35 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) =
                26.4
                           PEAK FLOW RATE(CFS) =
                                                 30.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*****
 FLOW PROCESS FROM NODE 20744.00 TO NODE 20745.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1920.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.30 CHANNEL SLOPE = 0.0978
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 30.84
 FLOW VELOCITY (FEET/SEC.) = 7.36 FLOW DEPTH (FEET) = 1.29
 TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 16.35
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20745.00 = 2665.59 FEET.
*****************
 FLOW PROCESS FROM NODE 20745.00 TO NODE 20745.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.35
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.745
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                            6.61
                                    0.75
                                          0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.17
                                   0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697
                           SUBAREA RUNOFF(CFS) = 7.47
 SUBAREA AREA(ACRES) = 6.78
 EFFECTIVE AREA(ACRES) = 33.13 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 33.1 PEAK FLOW RATE(CFS) =
                                                 36.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
FLOW PROCESS FROM NODE 20745.00 TO NODE 20746.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1920.00 DOWNSTREAM(FEET) = 1895.00
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 558.91 CHANNEL SLOPE = 0.0447
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             36.44
 FLOW VELOCITY (FEET/SEC.) = 3.81 FLOW DEPTH (FEET) = 0.80
 TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 18.79
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20746.00 = 3224.50 FEET.
******************
 FLOW PROCESS FROM NODE 20746.00 TO NODE 20746.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 18.79
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.605
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                              Αр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.76
                                      0.75
                                             0.600
                                                     56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.95 0.75 0.700
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
 SUBAREA AREA (ACRES) = 9.71
                            SUBAREA RUNOFF (CFS) = 9.50
 EFFECTIVE AREA(ACRES) = 42.84 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 42.8
                              PEAK FLOW RATE(CFS) =
                                                     41.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
******************
 FLOW PROCESS FROM NODE 20746.00 TO NODE 20747.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1895.00 DOWNSTREAM(FEET) = 1840.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 573.14 CHANNEL SLOPE = 0.0960
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              41.77
 FLOW VELOCITY (FEET/SEC.) = 5.23 FLOW DEPTH (FEET) = 0.73
 TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 20.62
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20747.00 = 3797.64 FEET.
******************
 FLOW PROCESS FROM NODE 20747.00 TO NODE 20747.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 20.62
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.518
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

Page 34

```
"3-4 DWELLINGS/ACRE" B 0.57 0.75 0.600
                                                                           >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE
                                                  56
                                                                           >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В
                           9.61
                                     0.75 0.700 56
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           TOTAL NUMBER OF STREAMS = 3
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 SUBAREA AREA(ACRES) = 10.18
                            SUBAREA RUNOFF (CFS) = 9.15
                                                                           TIME OF CONCENTRATION (MIN.) = 24.08
 EFFECTIVE AREA(ACRES) = 53.02 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           RAINFALL INTENSITY (INCH/HR) = 1.38
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.52
 TOTAL AREA (ACRES) = 53.0 PEAK FLOW RATE (CFS) =
                                                    47.57
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                           AREA-AVERAGED Ap = 0.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           EFFECTIVE STREAM AREA(ACRES) = 65.73
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                           TOTAL STREAM AREA(ACRES) = 65.73
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                                           51.20
*****************
                                                                           ** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 20747.00 TO NODE 20748.00 IS CODE = 54
                                                                           STREAM
                                                                                  0
                                                                                                 AREA
                                                                                                         HEADWATER
                                                                                         Tc
______
                                                                           NUMBER (CFS) (MIN.) (ACRES) NODE
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            1
                                                                                  537.89 36.66 753.64 20620.00
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             2
                                                                                 131.23 12.35
                                                                                                 94.59
                                                                                                          20730.00
_____
                                                                                   51.20 24.08 65.73 20740.00
 ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1815.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 752.37 CHANNEL SLOPE = 0.0332
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                           UNIT-HYDROGRAPH DATA:
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              47.57
                                                                           S-GRAPH: VALLEY(DEV.) = 76.6%; VALLEY(UNDEV.)/DESERT= 23.4%
 FLOW VELOCITY (FEET/SEC.) = 3.62 FLOW DEPTH (FEET) = 0.94
                                                                                 MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 TRAVEL TIME (MIN.) = 3.46 Tc (MIN.) = 24.08
                                                                           Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.47; Ybar = 0.56
 LONGEST FLOWPATH FROM NODE 20740.00 TO NODE 20748.00 = 4550.01 FEET.
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                           DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
******************
                                                                           3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 81
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20748.00 = 11898.10 FEET.
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           EQUIVALENT BASIN FACTOR APPROXIMATIONS:
_____
                                                                           Lca/L=0.3,n=.0459; Lca/L=0.4,n=.0411; Lca/L=0.5,n=.0378; Lca/L=0.6,n=.0352
 MAINLINE Tc(MIN.) = 24.08
                                                                           TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 144.13
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.384
                                                                           PEAK FLOW RATE (CFS) = 594.59
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         ********************
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           FLOW PROCESS FROM NODE 20748.00 TO NODE 20749.00 IS CODE = 54
 RESIDENTIAL
                                                                         ______
 "2 DWELLINGS/ACRE"
                    В
                           8.54
                                     0.75
                                             0.700
                                                  56
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 RESIDENTIAL
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                             2.23
                                     0.75
                                             0.600
                                                  56
 "3-4 DWELLINGS/ACRE"
                      В
                                                                         ______
 PUBLIC PARK
                      В
                             0.78
                                     0.75
                                             0.850
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1815.00 DOWNSTREAM(FEET) = 1700.00
 RESIDENTIAL
                                                                           CHANNEL LENGTH THRU SUBAREA (FEET) = 2764.03 CHANNEL SLOPE = 0.0416
                   В 1.16
                                                                           CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 "5-7 DWELLINGS/ACRE"
                                     0.75
                                            0.500 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673
                                                                           CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                           FLOW VELOCITY (FEET/SEC.) = 25.26 FLOW DEPTH (FEET) = 1.97
 SUBAREA AREA (ACRES) = 12.71 SUBAREA RUNOFF (CFS) = 10.06
 EFFECTIVE AREA(ACRES) = 65.73 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                           TRAVEL TIME (MIN.) = 1.82 Tc (MIN.) = 38.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14662.13 FEET.
 TOTAL AREA(ACRES) = 65.7
                            PEAK FLOW RATE(CFS) =
                                                    51.20
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           FLOW PROCESS FROM NODE 20749.00 TO NODE 20749.00 IS CODE = 81
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
******************
                                                                         _______
 FLOW PROCESS FROM NODE 20748.00 TO NODE 20748.00 IS CODE = 1
                                                                           MAINLINE Tc (MIN.) = 38.48
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.044
```

Date: 04/21/2014

File name: LR0207ZZ.RES

Date: 04/21/2014 File name: LR0207ZZ.RES

Page 36

SUBAREA LOSS RATE DATA(AMC II):		"5-7 DWELLINGS/ACRE"	в 17.57	0.75	0.500	56	
DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap	SCS	COMMERCIAL	В 0.79	0.75	0.100	56	
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL	L) CN	RESIDENTIAL					
RESIDENTIAL		"3-4 DWELLINGS/ACRE"	В 11.86	0.75	0.600	56	
"2 DWELLINGS/ACRE" B 46.16 0.75 0.700	56	RESIDENTIAL					
RESIDENTIAL		"2 DWELLINGS/ACRE"	В 51.53	0.75	0.700	56	
"3-4 DWELLINGS/ACRE" B 9.13 0.75 0.600	56	SUBAREA AVERAGE PERVIO	US LOSS RATE, Fp(I	NCH/HR) = 0	0.75		
RESIDENTIAL		SUBAREA AVERAGE PERVIO	US AREA FRACTION,	Ap = 0.637			
"5-7 DWELLINGS/ACRE" B 13.04 0.75 0.500	56	SUBAREA AREA(ACRES) =	81.75	-			
PUBLIC PARK B 14.63 0.75 0.850	56	UNIT-HYDROGRAPH DATA:					
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75		RAINFALL(INCH): 5M= 0.	30;30M= 0.61;1H= 0	.80;3H= 1.3	B;6H= 1.95	;24H= 4	.02
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684		S-GRAPH: VALLEY (DEV.) =	80.2%; VALLEY (UNDE)	V.)/DESERT=	19.8%		
SUBAREA AREA(ACRES) = 82.96		MOUNTAIN= 0.	0%; FOOTHILL= 0.0%	; DESERT (UND	EV.) = 0.09	9	
UNIT-HYDROGRAPH DATA:		Tc(HR) = 0.68; LAG(HR)	= $0.54$ ; Fm(INCH/H	R) = 0.47;	Ybar = 0.5	7	
RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95	5;24H= 4.02	USED SIERRA MADRE DEPT					
S-GRAPH: VALLEY(DEV.) = 78.6%; VALLEY(UNDEV.)/DESERT= 21.4%		DEPTH-AREA FACTORS: 5M					
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0	0%	3HR = 0.99; 6HR = 1.00			,		
Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.47; Ybar = 0.5		UNIT-INTERVAL(MIN) =		ACRES) =	1078.7		
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.		LONGEST FLOWPATH FROM	,	,		829.27	FEET.
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;		EQUIVALENT BASIN FACT					
3HR = 0.99; 6HR = 1.00; 24HR= 1.00		Lca/L=0.3,n=.0378; Lc			.0312:Lca/	[=0.6.n	=.0291
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 996.9		TIME OF PEAK FLOW(HR)	· ·	-		,	
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20749.00 = 14	4662.13 FEET.	UNIT-HYDROGRAPH PEAK F					
EOUIVALENT BASIN FACTOR APPROXIMATIONS:		TOTAL AREA(ACRES) =			(CFS) =	664.0	2
Lca/L=0.3,n=.0415; Lca/L=0.4,n=.0372; Lca/L=0.5,n=.0342;Lca/	/I.=0.6.n=.0319	10.000 (0.			()		=
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 156.04		SUBAREA AREA-AVERAGED	RAINFALL DEPTH (INC	H):			
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 631.00		5M = 0.30; 30M = 0.61;	•	•	= 1.95: 241	HR = 4.	03
TOTAL AREA (ACRES) = 996.9 PEAK FLOW RATE (CFS) =	631.00	,			_,,,		
		************	*****	****	*****	*****	*****
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):		FLOW PROCESS FROM NODE	20763.00 TO NODE	20763.00	IS CODE =	1	
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24	4HR = 4.03						
		>>>>DESIGNATE INDEPEN	DENT STREAM FOR CO	NFLUENCE<<<	<<		
**************	*****						
FLOW PROCESS FROM NODE 20749.00 TO NODE 20763.00 IS CODE =	54	TOTAL NUMBER OF STREAM	S = 2				
		CONFLUENCE VALUES USED	FOR INDEPENDENT S'	TREAM 1 ARI	Ξ:		
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<		PEAK FLOW RATE(CFS) =					
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>		AREA-AVERAGED Fm(INCH/	HR) = 0.47 Ybar	= 0.57			
	========	TOTAL AREA (ACRES) =					
ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET)	= 1600.00						
CHANNEL LENGTH THRU SUBAREA (FEET) = 3167.14 CHANNEL SLOPE		************	******	*****	*****	*****	*****
CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000		FLOW PROCESS FROM NODE	20750.00 TO NODE	20751.00	IS CODE =	21	
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 4.00							
CHANNEL FLOW THRU SUBAREA(CFS) = 631.00		>>>>RATIONAL METHOD I	NITIAL SUBAREA ANA	LYSIS<			
FLOW VELOCITY (FEET/SEC.) = 23.32 FLOW DEPTH (FEET) = 2.19	9	>>USE TIME-OF-CONCENTR	ATION NOMOGRAPH FO	R INITIAL S	JBAREA<<		
TRAVEL TIME (MIN.) = $2.26$ Tc (MIN.) = $40.75$							
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17	7829.27 FEET.	INITIAL SUBAREA FLOW-L	ENGTH (FEET) = 91	0.09			
		ELEVATION DATA: UPSTRE			EAM(FEET) :	= 215	0.00
**************	****						
FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE =	81	Tc = K*[(LENGTH** 3.00)]	)/(ELEVATION CHANGE	E)]**0.20			
		SUBAREA ANALYSIS USED					
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW		* 10 YEAR RAINFALL IN	·				
		SUBAREA TC AND LOSS RA	, , ,				
MAINLINE Tc(MIN.) = 40.75		DEVELOPMENT TYPE/	SCS SOIL AREA	Fp	Дp	SCS	Tc
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.009		LAND USE	GROUP (ACRES)	-	(DECIMAL)		
SUBAREA LOSS RATE DATA (AMC II):		RESIDENTIAL	(1101HD)	(==: ==:/	,	, 22.	, ,
DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap	SCS	"2 DWELLINGS/ACRE"	в 5.98	0.75	0.700	56	13.23
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL		RESIDENTIAL	2 3.30	0.75	3.700	5.0	10.20
RESIDENTIAL	,	"3-4 DWELLINGS/ACRE"	в 2.60	0.75	0.600	56	12.44
		5 1 Bulletinos/Hore	2 2.00	0.75		30	
Dato: 04/21/2014 File name: LB020777 BES	Page 27	Data: 04/31/3014	Filo namo: I D0207	77 DEC		Dogo 20	

Date: 04/21/2014

File name: LR0207ZZ.RES

Page 38

Date: 04/21/2014

File name: LR0207ZZ.RES

Page 37

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
 SUBAREA RUNOFF (CFS) = 12.01
 TOTAL AREA(ACRES) = 8.58 PEAK FLOW RATE(CFS) = 12.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
*****************
 FLOW PROCESS FROM NODE 20751.00 TO NODE 20752.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 2150.00 DOWNSTREAM(FEET) = 2120.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 482.67 CHANNEL SLOPE = 0.0622
 CHANNEL BASE (FEET) = 482.67 "Z" FACTOR = 2.500
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             12.01
 FLOW VELOCITY (FEET/SEC.) = 0.75 FLOW DEPTH (FEET) = 0.03
 TRAVEL TIME (MIN.) = 10.79 Tc (MIN.) = 23.24
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20752.00 = 1392.76 FEET.
************************
 FLOW PROCESS FROM NODE 20752.00 TO NODE 20752.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 23.24
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.413
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                 Fp
                                           Ар
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.44 0.75 0.600 56
 RESIDENTIAL
                    B 4.07 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 4.51 SUBAREA RUNOFF (CFS) = 3.64
 EFFECTIVE AREA(ACRES) = 13.09 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 13.1 PEAK FLOW RATE (CFS) = 12.01
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50
FLOW PROCESS FROM NODE 20752.00 TO NODE 20753.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2120.00 DOWNSTREAM ELEVATION(FEET) = 2100.00
 STREET LENGTH (FEET) = 408.17 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   21.76
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 14.21
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.09
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.09
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 24.57
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.367
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.61 0.75 0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 21.76 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 25.37 SUBAREA RUNOFF (CFS) = 19.50
 EFFECTIVE AREA(ACRES) = 38.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 38.5 PEAK FLOW RATE (CFS) = 29.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.09
 FLOW VELOCITY (FEET/SEC.) = 5.48 DEPTH*VELOCITY (FT*FT/SEC.) = 2.45
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 408.2 FT WITH ELEVATION-DROP = 20.0 FT, IS 48.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20753.00
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20753.00 = 1800.93 FEET.
******************
 FLOW PROCESS FROM NODE 20753.00 TO NODE 20754.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2100.00 DOWNSTREAM ELEVATION(FEET) = 2060.00
 STREET LENGTH (FEET) = 602.59 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

File name: LR0207ZZ.RES

Page 40

Date: 04/21/2014

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 33.95
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.01
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.33
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.83
 STREET FLOW TRAVEL TIME (MIN.) = 1.59 Tc (MIN.) = 26.16
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.316
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                     0.75 0.700 56
 "2 DWELLINGS/ACRE" B 9.79
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.89
                                        0.75 0.600 56
                        В
 SCHOOL
                               0.21
                                        0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 11.89 SUBAREA RUNOFF(CFS) = 8.63
 EFFECTIVE AREA(ACRES) = 50.35 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 50.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.48
 FLOW VELOCITY (FEET/SEC.) = 6.45 DEPTH*VELOCITY (FT*FT/SEC.) = 2.94
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20754.00 = 2403.52 FEET.
*****
 FLOW PROCESS FROM NODE 20754.00 TO NODE 20755.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2060.00 DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH (FEET) = 704.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 50.26
   ***STREET FLOWING FULL***
```

```
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.70
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.99
 STREET FLOW TRAVEL TIME (MIN.) = 2.17 Tc (MIN.) = 28.33
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.255
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 31.15 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.15 0.75 0.600
                                                          56
 SCHOOL
                         В
                                 3.45 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.676
 SUBAREA AREA (ACRES) = 40.75 SUBAREA RUNOFF (CFS) = 27.47
 EFFECTIVE AREA(ACRES) = 91.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 91.1 PEAK FLOW RATE (CFS) = 61.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.22
 FLOW VELOCITY (FEET/SEC.) = 5.77 DEPTH*VELOCITY (FT*FT/SEC.) = 3.37
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 704.6 FT WITH ELEVATION-DROP = 20.0 FT, IS 60.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20755.00
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20755.00 = 3108.10 FEET.
******************
 FLOW PROCESS FROM NODE 20755.00 TO NODE 20756.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2040.00 DOWNSTREAM ELEVATION(FEET) = 2000.00
 STREET LENGTH (FEET) = 785.85 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     64.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.45
```

Page 42

```
AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.13
                                                                                  RESIDENTIAL.
                                                                                                         B 8.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.92
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                                         0.75
                                                                                                                                 0.700
 STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 30.17
                                                                                  RESIDENTIAL
                                                                                                               2.04 0.75 0.600
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.208
                                                                                  "3-4 DWELLINGS/ACRE"
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA(ACRES) = 10.69 SUBAREA RUNOFF(CFS) = 6.32
                                                                                  EFFECTIVE AREA(ACRES) = 113.48 AREA-AVERAGED Fm(INCH/HR) = 0.51
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                              9.12
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                         0.75
                                                 0.700
                                                                                  TOTAL AREA (ACRES) = 113.5 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.57 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
                                                                                  5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.38: 6HR = 1.95: 24HR = 4.03
 SUBAREA AREA (ACRES) = 11.69 SUBAREA RUNOFF (CFS) = 7.38
 EFFECTIVE AREA(ACRES) = 102.79 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                  DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 20.09
 TOTAL AREA (ACRES) = 102.8 PEAK FLOW RATE (CFS) = 64.77
                                                                                  FLOW VELOCITY (FEET/SEC.) = 7.63 DEPTH*VELOCITY (FT*FT/SEC.) = 4.14
                                                                                  LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20757.00 = 4734.62 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                ******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
                                                                                  FLOW PROCESS FROM NODE 20757.00 TO NODE 20758.00 IS CODE = 63
                                                                                ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.39
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 7.16 DEPTH*VELOCITY (FT*FT/SEC.) = 3.92
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20756.00 = 3893.95 FEET.
                                                                                ______
                                                                                  UPSTREAM ELEVATION(FEET) = 1950.00 DOWNSTREAM ELEVATION(FEET) = 1920.00
STREET LENGTH (FEET) = 946.77 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20756.00 TO NODE 20757.00 IS CODE = 63
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 2000.00 DOWNSTREAM ELEVATION(FEET) = 1950.00
 STREET LENGTH (FEET) = 840.67 CURB HEIGHT (INCHES) = 6.0
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH(FEET) = 0.63
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 24.54
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.59
                                                                                   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.16
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 2.39 Tc (MIN.) = 34.40
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.117
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH(FEET) = 0.54
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fρ
   HALFSTREET FLOOD WIDTH (FEET) = 20.21
                                                                                      LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  RESIDENTIAL
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.15
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                      в 50.96
                                                                                                                         0.75
                                                                                                                                 0.700
 STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 32.01
                                                                                  RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.166
                                                                                  "3-4 DWELLINGS/ACRE"
                                                                                                       B 11.45
                                                                                                                         0.75
                                                                                                                                 0.600
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                               Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                        SCS
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  SUBAREA AREA(ACRES) = 62.41 SUBAREA RUNOFF(CFS) = 34.10
```

Date: 04/21/2014

File name: LR0207ZZ.RES

67.19

84.25

SCS

56

Page 44

```
EFFECTIVE AREA(ACRES) = 175.89 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 175.9 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 25.82
 FLOW VELOCITY (FEET/SEC.) = 6.84 DEPTH*VELOCITY (FT*FT/SEC.) = 4.49
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 946.8 FT WITH ELEVATION-DROP = 30.0 FT, IS 85.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20758.00
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20758.00 = 5681.39 FEET.
************************
 FLOW PROCESS FROM NODE 20758.00 TO NODE 20759.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1920.00 DOWNSTREAM ELEVATION(FEET) = 1875.00
 STREET LENGTH (FEET) = 1200.03 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 101.68
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 25.58
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.36
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.79
 STREET FLOW TRAVEL TIME (MIN.) = 2.72 Tc (MIN.) = 37.12
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.067
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                   Αp
                                                          SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 18.41 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.34
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
 SUBAREA AREA (ACRES) = 21.75 SUBAREA RUNOFF (CFS) = 10.87
 EFFECTIVE AREA(ACRES) = 197.64 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 197.6 PEAK FLOW RATE (CFS) =
                                                           99.23
```

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.65 HALFSTREET FLOOD WIDTH (FEET) = 25.34
 FLOW VELOCITY (FEET/SEC.) = 7.31 DEPTH*VELOCITY (FT*FT/SEC.) = 4.73
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20759.00 = 6881.42 FEET.
******************
 FLOW PROCESS FROM NODE 20759.00 TO NODE 20760.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1875.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1845.00
 FLOW LENGTH (FEET) = 1440.55 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 21.5 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 16.21
 PIPE-FLOW(CFS) =
                 99.23
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 38.60
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20760.00 = 8321.97 FEET.
*******************
 FLOW PROCESS FROM NODE 20760.00 TO NODE 20760.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
______
 MAINLINE Tc(MIN.) = 38.60
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.042
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   В 47.33
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 8.18 0.75
                                           0.600
                                                  56
 PUBLIC PARK
                    B
                           1.84
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA(ACRES) = 57.35
                           SUBAREA RUNOFF (CFS) = 27.14
 EFFECTIVE AREA(ACRES) = 254.99 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 255.0
                             PEAK FLOW RATE(CFS) = 121.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
FLOW PROCESS FROM NODE 20760.00 TO NODE 20761.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1845.00
```

Page 46

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

```
DOWNSTREAM NODE ELEVATION (FEET) = 1770.00
 FLOW LENGTH (FEET) = 1840.39 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 20.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.88
 PIPE-FLOW(CFS) = 121.97
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 40.00
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20761.00 = 10162.36 FEET.
*****************
 FLOW PROCESS FROM NODE 20761.00 TO NODE 20761.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 40.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.020
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                   Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 56.58
                                     0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.66 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA(ACRES) = 69.24 SUBAREA RUNOFF(CFS) = 31.81
 EFFECTIVE AREA(ACRES) = 324.23 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 324.2 PEAK FLOW RATE (CFS) = 148.71
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
FLOW PROCESS FROM NODE 20761.00 TO NODE 20762.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1770.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1740.00
 FLOW LENGTH (FEET) = 1572.80 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 26.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.45
 PIPE-FLOW(CFS) = 148.71
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.60 Tc (MIN.) = 41.60
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.997
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   в 7.27 0.75
                                             0.600 56
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                     B 33.52 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 40.79 SUBAREA RUNOFF (CFS) = 17.86
 EFFECTIVE AREA(ACRES) = 365.02 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 365.0
                               PEAK FLOW RATE (CFS) = 159.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                          STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 10.95
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.25
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20762.00 = 11735.16 FEET.
******************
 FLOW PROCESS FROM NODE 20762.00 TO NODE 20763.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1740.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1600.00
 FLOW LENGTH (FEET) = 1727.01 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 18.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 30.11
 PIPE-FLOW(CFS) = 159.66
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 42.55
 LONGEST FLOWPATH FROM NODE 20750.00 TO NODE 20763.00 = 13462.17 FEET.
FLOW PROCESS FROM NODE 20763.00 TO NODE 20763.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 42.55
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.983
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                    Fp
                                                      SCS
                                              Дp
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

Page 48

RESIDENTIAL	-	10.00	0.75	0 500	F.C			
"5-7 DWELLINGS/ACRE" RESIDENTIAL	В	19.08	U./5	0.500	56			
"2 DWELLINGS/ACRE"	P	133 50	0.75	0 700	5.6			
"Z DWELLINGS/ACKE" RESIDENTIAL	Ď	133.30	0.75	0.700	50			
	B	16 16	0.75	0 600	5.6			
"3-4 DWELLINGS/ACRE" COMMERCIAL	D	10.10	0.75	0.000	56			
MOBILE HOME PARK SUBAREA AVERAGE PERVIOUS					36			
SUBAREA AVERAGE PERVIOUS		-		. 73				
SUBAREA AREA (ACRES) = 1				3) = 86	7.4			
EFFECTIVE AREA (ACRES) =								
AREA-AVERAGED Fp (INCH/HF					- 0.43			
TOTAL AREA (ACRES) =					241 96			
TOTAL TRUET (TICHES)	330.7	111111111111111111111111111111111111111	10M 1471TD (	5157	211.50			
SUBAREA AREA-AVERAGED RA	ATNFAT.T. I	EPTH (INCH) .						
5M = 0.30; 30M = 0.61; 1			88: 6HR =	1.95: 24н	R = 4.03			
3.33, 3011 3.31, 1		, 1	,	,,, 2111				
******	******	*****	*****	*****	*****			
FLOW PROCESS FROM NODE	20763.00	TO NODE 20	763.00 I	S CODE =	1			
>>>>DESIGNATE INDEPENDE	ENT STREA	M FOR CONFLU	JENCE<<<<	<				
>>>>AND COMPUTE VARIOUS	CONFLUE	NCED STREAM	VALUES<<	<<<				
					========			
TOTAL NUMBER OF STREAMS	= 2							
CONFLUENCE VALUES USED F	FOR INDE	PENDENT STREA	AM 2 ARE	:				
TIME OF CONCENTRATION (M)	[N.) =	42.55						
RAINFALL INTENSITY (INCH/								
AREA-AVERAGED Fm (INCH/HF								
AREA-AVERAGED Fp(INCH/HF	•							
AREA-AVERAGED Ap = 0.66								
EFFECTIVE STREAM AREA(AC		550.66						
TOTAL STREAM AREA (ACRES)								
PEAK FLOW RATE(CFS) AT (			.96					
** CONFLUENCE DATA **								
STREAM Q Tc	ARE	CA HEADV	VATER					
NUMBER (CFS) (MIN.	.) (ACF	RES) NOI	Œ					
1 664.02 40.7	75 10	78.67 206						
2 241.96 42.5	55 .5	550.66 207	750.00					
	,		<del>-</del>					
COMPUTED CONFLUENCE EST	MATES AF	RE AS FOLLOWS	3:					
UNIT-HYDROGRAPH DATA:								
RAINFALL(INCH): 5M= 0.30	):30M= 0.	61:1H= 0.80:	3H= 1.38	:6H= 1.95:	24H= 4.03			
S-GRAPH: VALLEY(DEV.) = 8								
MOUNTAIN= 0.09								
Tc(HR) = 0.68; LAG(HR) = 0.54; Fm(INCH/HR) = 0.48; Ybar = 0.57 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.								
DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;								
3HR = 0.99; 6HR = 0.99;		•	0.9.	~ 1				
			701 -	1620 2				
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1629.3								
LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20763.00 = 17829.27 FEET.								
EQUIVALENT BASIN FACTOR			-0 =	1212.7 /7	-0 6 0001			
Lca/L=0.3,n=.0378; Lca/					=U.b,n=.U291			
TIME OF PEAK FLOW(HR) =			(AF) =	250.72				
PEAK FLOW RATE(CFS) =	9/9.09	,						
	nananan oran er	anarananan ere ere	and an an area of the second	nanananan ere ere				
******								
FLOW PROCESS FROM NODE	20763.00	TO NODE 20	)764.00 IS	S CODE =	54			

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>> \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1510.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 3292.21 CHANNEL SLOPE = 0.0273 CHANNEL BASE (FEET) = 10.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00 CHANNEL FLOW THRU SUBAREA(CFS) = 979.09 FLOW VELOCITY (FEET/SEC.) = 24.60 FLOW DEPTH (FEET) = 2.61 TRAVEL TIME (MIN.) = 2.23 Tc (MIN.) = 42.98LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 81 \_\_\_\_\_\_ >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_\_ MAINLINE Tc(MIN.) = 42.98\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.977 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" В 27.93 0.75 0.600 56 2.86 0.250 56 MOBILE HOME PARK В 0.75 RESIDENTIAL "2 DWELLINGS/ACRE" В 36.04 0.75 0.700 56 0.07 0.75 0.850 56 PUBLIC PARK В COMMERCIAL В 0.16 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.638 SUBAREA AREA(ACRES) = 67.06 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.03 S-GRAPH: VALLEY (DEV.) = 87.4%; VALLEY (UNDEV.) / DESERT= 12.6% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.72; LAG(HR) = 0.57; Fm(INCH/HR) = 0.48; Ybar = 0.57 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92; 3HR = 0.99; 6HR = 0.99; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1696.4 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0349; Lca/L=0.4,n=.0313; Lca/L=0.5,n=.0287; Lca/L=0.6,n=.0268 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 261.01 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 960.64 TOTAL AREA (ACRES) = 1696.4 PEAK FLOW RATE (CFS) = 979.09 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 152 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<< <

File name: LR0207ZZ.RES

Page 50

Date: 04/21/2014

PEAK FLOWRATE TABLE FILE NAME: 20764.DNA

\_\_\_\_\_\_

END OF STUDY SUMMARY:

TOTAL AREA (ACRES) = 1696.4 TC (MIN.) = 42.98

AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.57

PEAK FLOW RATE(CFS) = 979.09

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 51
 Date: 04/21/2014
 File name: LR0207ZZ.RES
 Page 52

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20852

DROLOGY - TO NODE 20852

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0208ZZ.DAT

TIME/DATE OF STUDY: 08:01 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE (LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000

USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
===	=====	=======	=======================================	======	=====	======	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.00 TO NODE 20800.50 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 706.90 ELEVATION DATA: UPSTREAM(FEET) = 2210.00 DOWNSTREAM(FEET) = 2170.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.095 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.331 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "2 DWELLINGS/ACRE" В 6.13 0.75 0.700 56 10.73 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 2.48 0.75 0.600 56 10.09 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.671 SUBAREA RUNOFF (CFS) = 14.17 TOTAL AREA (ACRES) = 8.61 PEAK FLOW RATE (CFS) = 14.17 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20800.50 TO NODE 20801.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 2170.00 DOWNSTREAM ELEVATION(FEET) = 2160.00

STREET LENGTH (FEET) = 371.36 CURB HEIGHT (INCHES) = 6.0

File name: LR0208ZZ.RES

Page 2

STREET HALFWIDTH (FEET) = 18.00

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.43
   HALFSTREET FLOOD WIDTH (FEET) = 15.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.67
 STREET FLOW TRAVEL TIME (MIN.) = 1.58 Tc (MIN.) = 11.68
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.136
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                      Fρ
                                                αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 4.82 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.32 0.75
                                               0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
 SUBAREA AREA(ACRES) = 6.14 SUBAREA RUNOFF(CFS) = 9.00
 EFFECTIVE AREA(ACRES) = 14.75 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 14.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.01
 FLOW VELOCITY (FEET/SEC.) = 4.04 DEPTH*VELOCITY (FT*FT/SEC.) = 1.80
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20801.00 = 1078.26 FEET.
******************
 FLOW PROCESS FROM NODE 20801.00 TO NODE 20802.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2160.00 DOWNSTREAM ELEVATION(FEET) = 2153.00
 STREET LENGTH (FEET) = 226.34 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 25.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.46
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.05
 STREET FLOW TRAVEL TIME (MIN.) = 0.85 Tc (MIN.) = 12.53
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.048
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.63 0.75 0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.58 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 6.21 SUBAREA RUNOFF (CFS) = 8.56
 EFFECTIVE AREA(ACRES) = 20.96 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 21.0 PEAK FLOW RATE (CFS) = 29.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.49
 FLOW VELOCITY (FEET/SEC.) = 4.57 DEPTH*VELOCITY (FT*FT/SEC.) = 2.18
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20802.00 = 1304.60 FEET.
******************
 FLOW PROCESS FROM NODE 20802.00 TO NODE 20803.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2153.00 DOWNSTREAM ELEVATION(FEET) = 2138.00
 STREET LENGTH (FEET) = 346.96 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.73
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   31.43
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.87
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.30
```

Page 4

Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.46
 STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 13.62
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.948
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 3.18
                                        0.75
                                                0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.51 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 3.69 SUBAREA RUNOFF (CFS) = 4.76
 EFFECTIVE AREA(ACRES) = 24.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 24.7 PEAK FLOW RATE (CFS) = 31.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 17.02
 FLOW VELOCITY (FEET/SEC.) = 5.29 DEPTH*VELOCITY (FT*FT/SEC.) = 2.47
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20803.00 = 1651.56 FEET.
*******************
 FLOW PROCESS FROM NODE 20803.00 TO NODE 20804.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2138.00 DOWNSTREAM ELEVATION(FEET) = 2133.00
 STREET LENGTH (FEET) = 266.26 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 40.50
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 20.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.38
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.42
 STREET FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 14.63
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.866
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE" B 12.65 0.75 0.700
                                                         56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.45 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA (ACRES) = 14.10 SUBAREA RUNOFF (CFS) = 17.13
 EFFECTIVE AREA(ACRES) = 38.75 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 38.8 PEAK FLOW RATE(CFS) = 47.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.80
 FLOW VELOCITY (FEET/SEC.) = 4.62 DEPTH*VELOCITY (FT*FT/SEC.) = 2.66
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20804.00 = 1917.82 FEET.
******************
 FLOW PROCESS FROM NODE 20804.00 TO NODE 20805.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2133.00 DOWNSTREAM ELEVATION(FEET) = 2128.00
 STREET LENGTH (FEET) = 315.22 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    52.98
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.74
 STREET FLOW TRAVEL TIME (MIN.) = 1.17 Tc (MIN.) = 15.80
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.782
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                 Αр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 7.96
                                         0.75
                                                 0.700
 RESIDENTIAL
                              2.07 0.75 0.600
 "3-4 DWELLINGS/ACRE"
                      В
                                                         56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.679
 SUBAREA AREA (ACRES) = 10.03 SUBAREA RUNOFF (CFS) = 11.50
 EFFECTIVE AREA(ACRES) = 48.78 AREA-AVERAGED Fm(INCH/HR) = 0.51
```

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 6

Date: 04/21/2014 File name: LR0208ZZ.RES Page 5

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 TOTAL AREA (ACRES) =
                     48.8
                              PEAK FLOW RATE(CFS) =
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 24.73
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                                  FLOW VELOCITY (FEET/SEC.) = 8.22 DEPTH*VELOCITY (FT*FT/SEC.) = 5.22
                                                                                  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                        AND L = 616.6 FT WITH ELEVATION-DROP = 30.0 FT, IS 85.1 CFS,
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.93
                                                                                        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20806.00
                                                                                  LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20806.00 = 2849.67 FEET.
 FLOW VELOCITY (FEET/SEC.) = 4.58 DEPTH*VELOCITY (FT*FT/SEC.) = 2.83
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20805.00 = 2233.04 FEET.
                                                                                 ******************
******************
                                                                                  FLOW PROCESS FROM NODE 20806.00 TO NODE 20807.00 IS CODE = 63
 FLOW PROCESS FROM NODE 20805.00 TO NODE 20806.00 IS CODE = 63
______
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                 ______
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  UPSTREAM ELEVATION(FEET) = 2098.00 DOWNSTREAM ELEVATION(FEET) = 2090.00
 UPSTREAM ELEVATION(FEET) = 2128.00 DOWNSTREAM ELEVATION(FEET) = 2098.00
                                                                                  STREET LENGTH (FEET) = 573.68 CURB HEIGHT (INCHES) = 6.0
 STREET LENGTH (FEET) = 616.63 CURB HEIGHT (INCHES) = 6.0
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 109.01
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    ***STREET FLOWING FULL***
   ***STREET FLOWING FULL***
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    STREET FLOW DEPTH (FEET) = 0.78
   STREET FLOW DEPTH (FEET) = 0.59
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 31.81
   HALFSTREET FLOOD WIDTH (FEET) = 22.53
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.20
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.63
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.51
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.84 Tc (MIN.) = 18.98
 STREET FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 17.14
                                                                                  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.596
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.696
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA(AMC II):
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        Fρ
                                                                                                                                  Aр
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                Αp
                                                        SCS
                                                                                      LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                  RESIDENTIAL
 RESIDENTIAL
                                                                                  "2 DWELLINGS/ACRE" B 2.85
                                                                                                                          0.75 0.700
                                                 0.700
 "2 DWELLINGS/ACRE"
                               36.94
                                         0.75
                                                       56
                      В
                                                                                  RESIDENTIAL
                                         0.75
                        В
                              3.99
                                                 0.600 56
                                                                                  "3-4 DWELLINGS/ACRE" B 1.45 0.75 0.600
 SCHOOT.
 RESIDENTIAL
                                                                                                        B
                                                                                                               0.68
                                                                                                                          0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
                              9.63
                                         0.75
                                                 0.600
                                                       56
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.657
 ".4 DWELLING/ACRE"
                       В
                              0.22
                                         0.75
                                                 0.900
                                                                                  SUBAREA AREA (ACRES) = 4.98 SUBAREA RUNOFF (CFS) = 4.95
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  EFFECTIVE AREA(ACRES) = 104.54 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA(ACRES) = 50.78 SUBAREA RUNOFF(CFS) = 54.48
                                                                                  TOTAL AREA (ACRES) = 104.5 PEAK FLOW RATE (CFS) = 106.54
 EFFECTIVE AREA(ACRES) = 99.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 99.6 PEAK FLOW RATE(CFS) = 106.54
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 7 File name: LR020877.RFS

Date: 04/21/2014

56

Page 8

```
END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.77 HALFSTREET FLOOD WIDTH(FEET) = 31.50
 FLOW VELOCITY (FEET/SEC.) = 5.18 DEPTH*VELOCITY (FT*FT/SEC.) = 3.99
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20807.00 = 3423.35 FEET.
FLOW PROCESS FROM NODE 20807.00 TO NODE 20808.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 2090.00 DOWNSTREAM ELEVATION(FEET) = 2070.00
 STREET LENGTH (FEET) = 620.19 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 110.69
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.17
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.14
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.88
 STREET FLOW TRAVEL TIME (MIN.) = 1.45 Tc (MIN.) = 20.43
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.527
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 αA
                                                       SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.19
                                        0.75
                                                0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.94
                                        0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA(ACRES) = 9.13
                              SUBAREA RUNOFF (CFS) = 8.31
 EFFECTIVE AREA(ACRES) = 113.67 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 113.7 PEAK FLOW RATE(CFS) =
                                                     106.54
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 26.80
 FLOW VELOCITY (FEET/SEC.) = 7.06 DEPTH*VELOCITY (FT*FT/SEC.) = 4.77
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20808.00 = 4043.54 FEET.
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 2070.00 DOWNSTREAM ELEVATION(FEET) = 2020.00
 STREET LENGTH (FEET) = 545.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.77
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 10.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.27
 STREET FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 21.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.490
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fp
                                                    αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 20.40
                                           0.75
                                                    0.700
                                                            56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                        В
                                3.29 0.75 0.600
                                                            56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA(ACRES) = 23.69 SUBAREA RUNOFF(CFS) = 20.82
 EFFECTIVE AREA(ACRES) = 137.36 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 137.4 PEAK FLOW RATE(CFS) = 121.29
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 23.08
 FLOW VELOCITY (FEET/SEC.) = 10.65 DEPTH*VELOCITY (FT*FT/SEC.) = 6.41
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.60
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
 ** PIPE SIZED TO MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.09
 PIPE-FLOW(CFS) =
                     63.16
 PIPEFLOW TRAVEL TIME (MIN.) = 0.45 Tc (MIN.) = 20.88
       Date: 04/21/2014
                        File name: LR0208ZZ.RES
                                                          Page 10
```

FLOW PROCESS FROM NODE 20808.00 TO NODE 20809.00 IS CODE = 63

Date: 04/21/2014 File name: LR0208ZZ.RES Page 9

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.507
 SUBAREA AREA(ACRES) = 23.69 SUBAREA RUNOFF(CFS) = 21.19
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) = 123.46
                                                                                     5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     END OF SUBAREA STREET FLOW HYDRAULICS:
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                                     DEPTH(FEET) = 0.79 HALFSTREET FLOOD WIDTH(FEET) = 32.42
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                     FLOW VELOCITY (FEET/SEC.) = 5.90 DEPTH*VELOCITY (FT*FT/SEC.) = 4.65
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 60.29
                                                                                     ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                                     ESTIMATED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                     ASSUME FULL-FLOWING PIPELINE
   STREET FLOW DEPTH (FEET) = 0.50
                                                                                     PIPE-FLOW VELOCITY (FEET/SEC.) = 10.86
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
                                                                                     PIPE-FLOW(CFS) =
                                                                                                        64.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.40
                                                                                     PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 21.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.19
                                                                                     * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.470
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20809.00 = 4588.54 FEET.
                                                                                     SUBAREA AREA (ACRES) = 15.54 SUBAREA RUNOFF (CFS) = 13.42
                                                                                     TOTAL AREA (ACRES) = 152.9 PEAK FLOW RATE (CFS) = 132.34
******************
 FLOW PROCESS FROM NODE 20809.00 TO NODE 20810.00 IS CODE = 63
                                                                                     SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                     5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                     STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                     STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 67.80
_____
                                                                                      ***STREET FLOWING FULL***
 UPSTREAM ELEVATION(FEET) = 2020.00 DOWNSTREAM ELEVATION(FEET) = 2010.00
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET LENGTH (FEET) = 570.75 CURB HEIGHT (INCHES) = 6.0
                                                                                      STREET FLOW DEPTH (FEET) = 0.65
 STREET HALFWIDTH (FEET) = 18.00
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 25.34
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.23
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                     LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20810.00 = 5159.29 FEET.
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   ******************
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     FLOW PROCESS FROM NODE 20810.00 TO NODE 20811.00 IS CODE = 63
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    >>>> (STREET TABLE SECTION # 5 USED) <<<<
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
                                                                                   ______
                                                                                     UPSTREAM ELEVATION(FEET) = 2010.00 DOWNSTREAM ELEVATION(FEET) = 1970.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 129.96
                                                                                    STREET LENGTH (FEET) = 617.03 CURB HEIGHT (INCHES) = 6.0
   ***STREET FLOWING FULL***
                                                                                     STREET HALFWIDTH (FEET) = 18.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.79
                                                                                     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
   HALFSTREET FLOOD WIDTH (FEET) = 32.60
                                                                                     INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.68
 STREET FLOW TRAVEL TIME (MIN.) = 1.61 Tc (MIN.) = 22.49
                                                                                     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.441
                                                                                     STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                     Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                     MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
      LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       B 12.89 0.75 0.700 56
                                                                                      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 147.10
 RESIDENTIAL
                                                                                      ***STREET FLOWING FULL***
 "3-4 DWELLINGS/ACRE" B 2.65 0.75
                                                                                      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                      STREET FLOW DEPTH (FEET) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
                                                                                      HALFSTREET FLOOD WIDTH (FEET) = 26.50
 SUBAREA AREA (ACRES) = 15.54 SUBAREA RUNOFF (CFS) = 13.01
                                                                                      AVERAGE FLOW VELOCITY (FEET/SEC.) = 9.96
 EFFECTIVE AREA(ACRES) = 152.90 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 6.67
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                     STREET FLOW TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 22.79
 TOTAL AREA (ACRES) = 152.9 PEAK FLOW RATE (CFS) = 128.35
                                                                                     * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.430
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 11

File name: LR0208ZZ.RES Page 12

Date: 04/21/2014

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                            FLOW VELOCITY (FEET/SEC.) = 3.96 FLOW DEPTH (FEET) = 0.90
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                                                             TRAVEL TIME (MIN.) = 6.12 Tc (MIN.) = 28.44
                                      Fρ
                                              Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20812.00 = 7229.41 FEET.
 RESIDENTIAL
                                                                           ******************
 "2 DWELLINGS/ACRE"
                     в 30.03
                                      0.75
                                              0.700
 RESIDENTIAL
                                                                            FLOW PROCESS FROM NODE 20812.00 TO NODE 20812.00 IS CODE = 81
                            5.60
                                      0.75
                                             0.600
 "3-4 DWELLINGS/ACRE"
                    В
                                      0.75 0.850 56
 PUBLIC PARK
                      В
                              0.12
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           _____
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.685
                                                                            MAINLINE Tc (MIN.) = 28.44
 SUBAREA AREA (ACRES) = 35.75 SUBAREA RUNOFF (CFS) = 29.53
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.252
 EFFECTIVE AREA(ACRES) = 188.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                             DEVELOPMENT TYPE/
                                                                                              SCS SOIL AREA
                                                                                                               Fp
 TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = 156.31
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
                                                                            RESIDENTIAL
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            "2 DWELLINGS/ACRE"
                                                                                                       6.60
                                                                                                                  0.75
                                                                                                                         0.700
                                                                                                                                 56
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B 0.55 0.75 0.600
                                                                                                                                 56
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                            PUBLIC PARK
                                                                                                 B 18.85
                                                                                                                 0.75 0.850
 DEPTH(FEET) = 0.68 HALFSTREET FLOOD WIDTH(FEET) = 27.17
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 10.09 DEPTH*VELOCITY (FT*FT/SEC.) = 6.89
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.807
                                                                            SUBAREA AREA(ACRES) = 26.00
                                                                                                       SUBAREA RUNOFF (CFS) = 15.18
 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
                                                                            EFFECTIVE AREA(ACRES) = 214.65 AREA-AVERAGED Fm(INCH/HR) = 0.52
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 SIZE PIPE(S) TO SATISFY THE STREET CONSTRAINT AS FOLLOWS:
                                                                            TOTAL AREA (ACRES) = 214.6 PEAK FLOW RATE (CFS) = 159.36
 ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
                                                                            NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 ESTIMATED PIPE DIAMETER(INCH) = 27.00 NUMBER OF PIPES = 1
 ASSUME FULL-FLOWING PIPELINE
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.27
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 PIPE-FLOW(CFS) = 72.69
                                                                           ******************
 PIPEFLOW TRAVEL TIME (MIN.) = 0.56 Tc (MIN.) = 22.32
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.448
                                                                             FLOW PROCESS FROM NODE 20812.00 TO NODE 20813.00 IS CODE = 54
 SUBAREA AREA(ACRES) = 35.75 SUBAREA RUNOFF(CFS) = 30.10
                                                                           ______
 TOTAL AREA (ACRES) = 188.6 PEAK FLOW RATE (CFS) = 159.36
                                                                            >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           _____
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                            ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1870.00
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                            CHANNEL LENGTH THRU SUBAREA (FEET) = 1523.12 CHANNEL SLOPE = 0.0263
                                                                            CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.67
   ***STREET FLOWING FULL***
                                                                            MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                            CHANNEL FLOW THRU SUBAREA(CFS) = 159.36
   STREET FLOW DEPTH (FEET) = 0.57
                                                                            FLOW VELOCITY (FEET/SEC.) = 3.32 FLOW DEPTH (FEET) = 0.98
                                                                            TRAVEL TIME (MIN.) = 7.64 Tc (MIN.) = 36.08
   HALFSTREET FLOOD WIDTH (FEET) = 21.74
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.51
                                                                            LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20813.00 = 8752.53 FEET.
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.89
                                                                           *******************
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20811.00 = 5776.32 FEET.
                                                                            FLOW PROCESS FROM NODE 20813.00 TO NODE 20813.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 20811.00 TO NODE 20812.00 IS CODE = 54
                                                                            >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           ______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            MAINLINE Tc (MIN.) = 36.08
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.085
_____
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1970.00 DOWNSTREAM(FEET) = 1910.00
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fp Ap
                                                                                                                                SCS
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1453.09 CHANNEL SLOPE = 0.0413
                                                                              LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                            PUBLIC PARK
                                                                                                B 80.80 0.75 0.850
                                                                                                                                56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                            RESIDENTIAL
                                                                            "2 DWELLINGS/ACRE" B 130.26 0.75 0.700
 CHANNEL FLOW THRU SUBAREA(CFS) = 159.36
```

Date: 04/21/2014 File name: LR0208ZZ.RES Page 13

Date: 04/21/2014 File name: LR0208ZZ.RES

Page 14

RESIDENTIAL	
"3-4 DWELLINGS/ACRE" B 24.87 0.75 0.600 56 RESIDENTIAL	**************************************
".4 DWELLING/ACRE" B 2.88 0.75 0.900 56	
NATURAL FAIR COVER	>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
"OPEN BRUSH" B 0.24 0.61 1.000 66 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	>>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.743	UPSTREAM NODE ELEVATION(FEET) = 1800.00
SUBAREA AREA(ACRES) = 239.05 SUBAREA RUNOFF(CFS) = 113.99	DOWNSTREAM NODE ELEVATION(FEET) = 1720.00
EFFECTIVE AREA(ACRES) = 453.70 AREA-AVERAGED Fm(INCH/HR) = 0.54	FLOW LENGTH (FEET) = 1968.59 MANNING'S N = 0.013
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72	
TOTAL AREA (ACRES) = 453.7 PEAK FLOW RATE (CFS) = 223.09	USER SPECIFIED PIPE DIAMETER (INCH) = 66.00 NUMBER OF PIPES = 1
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	DEPTH OF FLOW IN 66.0 INCH PIPE IS 28.0 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 26.45
50BAREA AREA-AVERAGED RAINFALL DEFIN(INCH).  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82	PIPE-FLOW (CFS) = 253.82
	*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
******************	PIPEFLOW TRAVEL TIME(MIN.) = 1.24 Tc(MIN.) = 38.29
FLOW PROCESS FROM NODE 20813.00 TO NODE 20814.00 IS CODE = 42	LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20815.00 = 12264.06 FEET.
ANNA COMPUTE DADE TO MENTER THE THE THE STATE OF THE STAT	******************
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<	FLOW PROCESS FROM NODE 20815.00 TO NODE 20815.00 IS CODE = 81
UPSTREAM NODE ELEVATION(FEET) = 1870.00  DOWNSTREAM NODE ELEVATION(FEET) = 1800.00	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
FLOW LENGTH (FEET) = 1542.94 MANNING'S N = 0.013	MAINLINE Tc(MIN.) = 38.29
	* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.048
USER SPECIFIED PIPE DIAMETER (INCH) = 63.00 NUMBER OF PIPES = 1	SUBAREA LOSS RATE DATA(AMC II):
DEPTH OF FLOW IN 63.0 INCH PIPE IS 25.9 INCHES	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
PIPE-FLOW VELOCITY (FEET/SEC.) = 26.66	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
PIPE-FLOW(CFS) = 223.09	RESIDENTIAL "3-4 DWELLINGS/ACRE" B 28.73 0.75 0.600 56
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PIPEFLOW TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 37.05	"3-4 DWELLINGS/ACRE" B 28.73 0.75 0.600 56 RESIDENTIAL
LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20814.00 = 10295.47 FEET.	"2 DWELLINGS/ACRE" B 126.12 0.75 0.700 56 PUBLIC PARK B 14.88 0.75 0.850 56
******************	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
FLOW PROCESS FROM NODE 20814.00 TO NODE 20814.00 IS CODE = 81	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
	SUBAREA AREA(ACRES) = 169.73 SUBAREA RUNOFF(CFS) = 80.46
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>	EFFECTIVE AREA(ACRES) = 700.00 AREA-AVERAGED Fm(INCH/HR) = 0.53
MATERIA DE ANTICO DE LA CONTRACTOR DE LA	AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.71
MAINLINE Tc(MIN.) = 37.05 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.068	TOTAL AREA (ACRES) = 700.0 PEAK FLOW RATE (CFS) = 324.31
SUBAREA LOSS RATE DATA (AMC II):	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	
RESIDENTIAL	******************
"3-4 DWELLINGS/ACRE" B 11.54 0.75 0.600 56 RESIDENTIAL	FLOW PROCESS FROM NODE 20815.00 TO NODE 20815.00 IS CODE = 71
"2 DWELLINGS/ACRE" B 58.78 0.75 0.700 56	>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD
PUBLIC PARK B 6.25 0.75 0.850 56	>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.697	UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
SUBAREA AREA(ACRES) = 76.57 SUBAREA RUNOFF(CFS) = 37.69 EFFECTIVE AREA(ACRES) = 530.27 AREA-AVERAGED Fm(INCH/HR) = 0.54	RAINFALL(INCH): 5M= 0.30;3UM= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82 S-GRAPH: VALLEY(DEV.)= 99.5%;VALLEY(UNDEV.)/DESERT= 0.5%
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.72	MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.)= 0.0%
TOTAL AREA (ACRES) = 530.3 PEAK FLOW RATE (CFS) = 253.82	Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.53; Ybar = 0.64
	USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82	3HR = 1.00; 6HR = 1.00; 24HR= 1.00
Date: 04/21/2014 File name: LD020077 DEC Dags 15	D + 04/04/0044

Date: 04/21/2014 File name: LR0208ZZ.RES Page 15

File name: LR0208ZZ.RES

Page 16

Date: 04/21/2014

```
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 700.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20815.00 = 12264.06 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0490; Lca/L=0.4,n=.0439; Lca/L=0.5,n=.0403; Lca/L=0.6,n=.0376
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 89.79
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 441.79
 TOTAL PEAK FLOW RATE (CFS) = 441.79 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE (CFS) = 324.31
  (UPSTREAM NODE PEAK FLOW RATE (CFS) = 324.31)
 PEAK FLOW RATE (CFS) USED = 441.79
******************
 FLOW PROCESS FROM NODE 20815.00 TO NODE 20816.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00
 FLOW LENGTH (FEET) = 1236.10 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 7.91
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 18.62
 BOX-FLOW(CFS) = 441.79
 BOX-FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 39.39
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
FLOW PROCESS FROM NODE 20816.00 TO NODE 20816.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 39.39
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.030
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Ар
                                                     SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.74
                                    0.75
                                              0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 40.54
                                      0.75
                                              0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
 SUBAREA AREA(ACRES) = 52.28
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.53; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 752.3
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20816.00 = 13500.16 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0467; Lca/L=0.4, n=.0418; Lca/L=0.5, n=.0384; Lca/L=0.6, n=.0359
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 96.88
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 466.93
 TOTAL AREA (ACRES) = 752.3 PEAK FLOW RATE (CFS) = 466.93
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
*****************
 FLOW PROCESS FROM NODE 20816.00 TO NODE 20823.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1635.00
 FLOW LENGTH (FEET) = 1150.94 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 7.65
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 20.34
 BOX-FLOW(CFS) = 466.93
 BOX-FLOW TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 40.34
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 40.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.015
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    B 8.26 0.75 0.700
                                                     56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.53 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 SUBAREA AREA(ACRES) = 10.79
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.53; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 763.1
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0449; Lca/L=0.4,n=.0403; Lca/L=0.5,n=.0370; Lca/L=0.6,n=.0345
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 98.34
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 466.10
 TOTAL AREA (ACRES) = 763.1
                               PEAK FLOW RATE (CFS) = 466.93
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
```

File name: LR020877.RFS

Page 18

Date: 04/21/2014

Date: 04/21/2014 File name: LR0208ZZ.RES Page 17

```
STREET FLOW DEPTH (FEET) = 0.43
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 15.07
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
                                                                               AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.09
 TOTAL NUMBER OF STREAMS = 2
                                                                               PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 2.73 Tc (MIN.) = 15.19
 PEAK FLOW RATE (CFS) = 466.93 Tc (MIN.) = 40.34
                                                                              * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.824
 AREA-AVERAGED Fm (INCH/HR) = 0.53 Ybar = 0.63
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 TOTAL AREA (ACRES) = 763.1
                                                                              DEVELOPMENT TYPE/
                                                                                               SCS SOIL AREA
                                                                                                                   Fρ
                                                                                  LAND USE
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
*******************
                                                                              RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE" B 4.10 0.75 0.600
 FLOW PROCESS FROM NODE 20820.00 TO NODE 20821.00 IS CODE = 21
                                                                              RESIDENTIAL
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                              "2 DWELLINGS/ACRE" B 9.73 0.75 0.700
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.670
                                                                              SUBAREA AREA (ACRES) = 13.83 SUBAREA RUNOFF (CFS) = 16.46
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 724.32
 ELEVATION DATA: UPSTREAM(FEET) = 1735.00 DOWNSTREAM(FEET) = 1720.00
                                                                              EFFECTIVE AREA(ACRES) = 21.91 AREA-AVERAGED Fm(INCH/HR) = 0.50
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                              TOTAL AREA (ACRES) = 21.9 PEAK FLOW RATE (CFS) = 26.06
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.463
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.054
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                              5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                             Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 RESIDENTIAL
                                                                              DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.87
 "3-4 DWELLINGS/ACRE" B 2.07
                                       0.75
                                              0.600
                                                     56 12.46
                                                                              FLOW VELOCITY (FEET/SEC.) = 4.40 DEPTH*VELOCITY (FT*FT/SEC.) = 2.04
                                                                              LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20822.00 = 1393.04 FEET.
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 6.01 0.75 0.700 56 13.25
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
                                                                              FLOW PROCESS FROM NODE 20822.00 TO NODE 20823.00 IS CODE = 33
 SUBAREA RUNOFF (CFS) = 11.27
 TOTAL AREA (ACRES) = 8.08 PEAK FLOW RATE (CFS) = 11.27
                                                                              >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            ______
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1700.00
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1635.00
********************
                                                                              FLOW LENGTH (FEET) = 1753.00 MANNING'S N = 0.013
 FLOW PROCESS FROM NODE 20821.00 TO NODE 20822.00 IS CODE = 63
______
                                                                              USER SPECIFIED PIPE DIAMETER (INCH) = 33.00 NUMBER OF PIPES = 1
                                                                              DEPTH OF FLOW IN 33.0 INCH PIPE IS 11.4 INCHES
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              PIPE-FLOW VELOCITY(FEET/SEC.) = 14.34
_____
                                                                              PIPE-FLOW(CFS) =
                                                                                               26.06
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
                                                                              *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 STREET LENGTH (FEET) = 668.72 CURB HEIGHT (INCHES) = 6.0
                                                                              PIPEFLOW TRAVEL TIME (MIN.) = 2.16 Tc (MIN.) = 17.35
 STREET HALFWIDTH (FEET) = 18.00
                                                                              * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.684
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                              DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                          αA
                                                                                                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  LAND USE
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              RESIDENTIAL
                                                                              "2 DWELLINGS/ACRE"
                                                                                                  в 28.07
                                                                                                                    0.75
                                                                                                                           0.700
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                              RESIDENTIAL
                                                                              "3-4 DWELLINGS/ACRE" B 8.56 0.75 0.600
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
                                                                              SUBAREA AREA(ACRES) = 36.63 SUBAREA RUNOFF(CFS) = 38.84
                                                                              EFFECTIVE AREA(ACRES) = 58.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.52
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              TOTAL AREA (ACRES) = 58.5 PEAK FLOW RATE (CFS) = 62.14
```

Page 19

Date: 04/21/2014

File name: LR0208ZZ.RES

Date: 04/21/2014 File name: LR0208ZZ.RES Page 20

Αp

56

56

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 36.08
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.56
 LONGEST FLOWPATH FROM NODE 20820.00 TO NODE 20823.00 = 3146.04 FEET.
******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20823.00 IS CODE = 1
._____
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 17.35
 RAINFALL INTENSITY (INCH/HR) = 1.68
 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.67
 EFFECTIVE STREAM AREA(ACRES) = 58.54
 TOTAL STREAM AREA(ACRES) = 58.54
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 62.14
 ** CONFLUENCE DATA **
 STREAM
                  Tc
                        AREA
                                   HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                     NODE
   1
          466.93 40.34 763.07 20800.00
           62.14 17.35 58.54 20820.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.6%; VALLEY(UNDEV.) / DESERT = 0.4%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.53; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) =
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20823.00 = 14651.10 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
```

File name: LR020877.RFS

Page 21

Date: 04/21/2014

```
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 106.31
 PEAK FLOW RATE (CFS) = 501.28
*******************
 FLOW PROCESS FROM NODE 20823.00 TO NODE 20824.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1635.00 DOWNSTREAM(FEET) = 1599.00
 FLOW LENGTH (FEET) = 1479.71 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 3.00
 *GIVEN BOX HEIGHT(FEET) = 3.00 ESTIMATED BOX BASEWIDTH(FEET) = 9.96
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.78
 BOX-FLOW(CFS) = 501.28
 BOX-FLOW TRAVEL TIME (MIN.) = 1.47 Tc (MIN.) = 41.80
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.
******************
 FLOW PROCESS FROM NODE 20824.00 TO NODE 20824.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 41.80
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.994
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                                     SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 96.44
                                       0.75
                                              0.700
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       B 25.64
                                       0.75
                                              0.600
                                                      56
 COMMERCIAL
                       В
                            1.07
                                       0.75
                                              0.100
                                                      56
 PUBLIC PARK
                             0.22
                                       0.75
                                              0.850
                                                      56
                       В
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                       В
                             3.67
                                       0.63 1.000
                                                      65
 SCHOOL
                              0.34
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 127.38
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.3%; VALLEY(UNDEV.) / DESERT = 0.7%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.70; LAG(HR) = 0.56; Fm(INCH/HR) = 0.53; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 949.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20824.00 = 16130.81 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0430; Lca/L=0.4,n=.0385; Lca/L=0.5,n=.0354; Lca/L=0.6,n=.0330
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 123.48
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 556.93
 TOTAL AREA (ACRES) = 949.0 PEAK FLOW RATE (CFS) =
                                                     556.93
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Lca/L=0.3,n=.0449; Lca/L=0.4,n=.0403; Lca/L=0.5,n=.0370; Lca/L=0.6,n=.0345

Date: 04/21/2014 File name: LR0208ZZ.RES Page 22

```
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1535.00
 FLOW LENGTH (FEET) = 755.22 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 93.0 INCH PIPE IS 45.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 24.85
 PIPE-FLOW(CFS) = 573.19
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 42.94
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
******************
 FLOW PROCESS FROM NODE 20826.00 TO NODE 20826.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 42.94
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.978
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                 Αp
                                                       SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B
                              9.73
                                        0.75
                                                0.600
                                                        56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               0.52
                                        0.63
                                              1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.620
 SUBAREA AREA(ACRES) = 10.25
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.57; Fm(INCH/HR) = 0.53; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1008.0
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20826.00 = 18097.60 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0403; Lca/L=0.4, n=.0362; Lca/L=0.5, n=.0332; Lca/L=0.6, n=.0310
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 131.35
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 569.89
 TOTAL AREA (ACRES) = 1008.0
                                 PEAK FLOW RATE(CFS) =
                                                       573.19
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
FLOW PROCESS FROM NODE 20826.00 TO NODE 20827.00 IS CODE = 48
```

File name: LR020877.RFS

Page 24

Date: 04/21/2014

\*

FLOW PROCESS FROM NODE 20825.00 TO NODE 20826.00 IS CODE = 42

Date: 04/21/2014 File name: LR0208ZZ.RES Page 23

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82

```
>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1500.00
 FLOW LENGTH (FEET) = 969.04 MANNING'S N = 0.013
 GIVEN BOX BASEWIDTH(FEET) = 10.00 GIVEN BOX HEIGHT(FEET) = 3.50
 FLOWDEPTH IN BOX IS 2.06 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 27.89
 BOX-FLOW(CFS) = 573.19
 BOX-FLOW TRAVEL TIME (MIN.) = 0.58 Tc (MIN.) = 43.52
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
*****
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20827.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 43.52
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.970
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                              Дp
                                                     SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 21.08
                                     0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.08
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.73; LAG(HR) = 0.58; Fm(INCH/HR) = 0.52; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1029.1
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20827.00 = 19066.64 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0393; Lca/L=0.4,n=.0352; Lca/L=0.5,n=.0323; Lca/L=0.6,n=.0302
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 134.59
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 582.45
 TOTAL AREA(ACRES) = 1029.1 PEAK FLOW RATE(CFS) =
                                                     582.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
*****************
 FLOW PROCESS FROM NODE 20827.00 TO NODE 20828.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1480.00
 FLOW LENGTH (FEET) = 712.41 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 10.00 GIVEN BOX HEIGHT(FEET) = 3.50
 FLOWDEPTH IN BOX IS 2.38 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 24.44
 BOX-FLOW(CFS) = 582.45
 BOX-FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 44.00
```

```
LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
******************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20828.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 44.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.964
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Aр
                                                     SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 24.73 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 24.73
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.)/DESERT= 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.73; LAG(HR) = 0.59; Fm(INCH/HR) = 0.52; Ybar = 0.63
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1053.8
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20828.00 = 19779.05 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0386; Lca/L=0.4, n=.0346; Lca/L=0.5, n=.0317; Lca/L=0.6, n=.0296
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 138.39
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 597.12
 TOTAL AREA(ACRES) = 1053.8
                               PEAK FLOW RATE(CFS) =
                                                    597.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
******************
 FLOW PROCESS FROM NODE 20828.00 TO NODE 20829.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 766.85 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH(FEET) = 10.00 GIVEN BOX HEIGHT(FEET) = 3.50
 *GIVEN BOX HEIGHT(FEET) = 3.50 ESTIMATED BOX BASEWIDTH(FEET) = 10.41
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.38
 BOX-FLOW(CFS) = 597.12
 BOX-FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 44.78
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 44.78
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.953
```

File name: LR0208ZZ.RES

Page 26

Date: 04/21/2014

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Αp
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           13.31
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 13.31
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.93;24H= 3.82
 S-GRAPH: VALLEY(DEV.) = 99.2%; VALLEY(UNDEV.) / DESERT = 0.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.52; Ybar = 0.62
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0380; Lca/L=0.4, n=.0341; Lca/L=0.5, n=.0313; Lca/L=0.6, n=.0292
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 140.43
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 602.09
 TOTAL AREA (ACRES) = 1067.2
                          PEAK FLOW RATE(CFS) =
                                                  602.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
___________
 PEAK FLOWRATE TABLE FILE NAME: 20764.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 979.09 Tc (MIN.) = 42.98
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.57
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
********************
 FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 979.09 Tc (MIN.) = 42.98
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.57
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20764.00 = 21121.48 FEET.
```

```
______
 >>>>CLEAR MEMORY BANK # 2 <<<<
FLOW PROCESS FROM NODE 20764.00 TO NODE 20829.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1465.00
 FLOW LENGTH (FEET) = 1297.04 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 15.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 2.28 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 28.67
 BOX-FLOW(CFS) = 979.09
 BOX-FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 43.73
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 11
_______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE(CFS) =
                     979.09 Tc(MIN.) = 43.73
 AREA-AVERAGED Fm (INCH/HR) = 0.48 Ybar = 0.57
 TOTAL AREA (ACRES) = 1696.4
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 602.09 Tc (MIN.) = 44.78
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.62
 TOTAL AREA (ACRES) = 1067.2
 LONGEST FLOWPATH FROM NODE 20800.00 TO NODE 20829.00 = 20545.90 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.94;24H= 3.95
 S-GRAPH: VALLEY (DEV.) = 92.0%; VALLEY (UNDEV.) / DESERT= 8.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.73; LAG(HR) = 0.58; Fm(INCH/HR) = 0.50; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2763.5
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20829.00 = 22418.52 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280; Lca/L=0.6,n=.0261
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 396.34
 PEAK FLOW RATE (CFS) = 1447.52
*******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20829.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
```

FLOW PROCESS FROM NODE 20764.00 TO NODE 20764.00 IS CODE = 12

Date: 04/21/2014 File name: LR0208ZZ.RES Page 27

Date: 04/21/2014

```
******************
 FLOW PROCESS FROM NODE 20829.00 TO NODE 20852.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1413.00
 FLOW LENGTH (FEET) = 2003.77 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 24.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 2.28 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 26.41
 BOX-FLOW(CFS) = 1447.52
 BOX-FLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 44.99
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
*******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1447.52 Tc (MIN.) = 44.99
 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.59
 TOTAL AREA (ACRES) = 2763.5
******************
 FLOW PROCESS FROM NODE 20830.00 TO NODE 20831.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 814.59
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1475.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.868
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.363
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Дp
                                                   SCS Tc
                                  Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В 6.12
                                   0.75
                                           0.600
                                                   56 13.37
                     в 1.79
                                   0.75
                                            0.100 56 9.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.487
 SUBAREA RUNOFF (CFS) = 14.23
 TOTAL AREA(ACRES) = 7.91 PEAK FLOW RATE(CFS) = 14.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
*****************
 FLOW PROCESS FROM NODE 20831.00 TO NODE 20832.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

```
UPSTREAM NODE ELEVATION (FEET) = 1475.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1464.00
 FLOW LENGTH (FEET) = 301.44 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 6.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.90
 PIPE-FLOW(CFS) = 14.23
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 10.36
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.295
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.31 0.75 0.600
 COMMERCIAL
                       В
                               3.62 0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.434
 SUBAREA AREA(ACRES) = 10.93
                                SUBAREA RUNOFF(CFS) = 19.38
 EFFECTIVE AREA(ACRES) = 18.84 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA(ACRES) = 18.8
                                 PEAK FLOW RATE (CFS) =
                                                           33.13
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 4.03
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0
                            STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 18.90
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 14.29
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.38
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.80
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20832.00 = 1116.03 FEET.
*******************
 FLOW PROCESS FROM NODE 20832.00 TO NODE 20833.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1464.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1440.00
 FLOW LENGTH (FEET) = 991.27 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
```

DEPTH OF FLOW IN 72.0 INCH PIPE IS 11.0 INCHES

Date: 04/21/2014 File name: LR0208ZZ.RES Page 29 Date: 04/21/2014 File name: LR0208ZZ.RES Page 30

```
PIPE-FLOW VELOCITY (FEET/SEC.) = 12.17
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 11.71
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20833.00 = 2107.30 FEET.
******************
 FLOW PROCESS FROM NODE 20833.00 TO NODE 20833.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 11.71
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.132
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                    Fр
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                         23.09
                                    0.75
                                          0.600
                                                  56
 COMMERCIAL
                    В
                           9.26
                                  0.75
                                            0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
 SUBAREA AREA(ACRES) = 32.35
                           SUBAREA RUNOFF (CFS) = 52.12
 EFFECTIVE AREA(ACRES) = 51.19 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 51.2
                            PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
FLOW PROCESS FROM NODE 20833.00 TO NODE 20852.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1440.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1413.00
 FLOW LENGTH (FEET) = 1064.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 17.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.18
 PIPE-FLOW(CFS) =
                 82.48
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 12.81
 LONGEST FLOWPATH FROM NODE 20830.00 TO NODE 20852.00 = 3171.64 FEET.
******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 12.81
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.020
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
```

```
В
                             3.54
                                      0.75 0.250
 MOBILE HOME PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.400
 SUBAREA AREA(ACRES) = 6.21
                             SUBAREA RUNOFF(CFS) =
 EFFECTIVE AREA(ACRES) = 57.40 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) =
                  57.4
                               PEAK FLOW RATE(CFS) =
                                                    86.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
*******************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 12.81
 RAINFALL INTENSITY (INCH/HR) = 2.02
 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45
 EFFECTIVE STREAM AREA(ACRES) = 57.40
 TOTAL STREAM AREA(ACRES) = 57.40
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  86.96
******************
 FLOW PROCESS FROM NODE 20840.00 TO NODE 20841.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 708.14
 ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1600.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.898
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.701
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Αp
                                                    SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                              3.00
                                             0.500
                                                    56 10.11
                     В
                                      0.75
                                      0.75
 COMMERCIAL
                             5.71
                                                        7.90
                       В
                                             0.100
                                                    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                            1.09
                                      0.75
                                             0.600
                      В
                                                    56 10.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.278
 SUBAREA RUNOFF (CFS) = 21.99
 TOTAL AREA (ACRES) = 9.80 PEAK FLOW RATE (CFS) =
                                               21.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
******************
 FLOW PROCESS FROM NODE 20841.00 TO NODE 20842.00 IS CODE = 54
```

File name: LR0208ZZ.RES

В

2.67

0.75

0.600

56

"3-4 DWELLINGS/ACRE"

Date: 04/21/2014 File name: LR0208ZZ.RES Page 31 Date: 04/21/2014

Page 32

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                         MAINLINE Tc(MIN.) = 9.59
______
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.403
 ELEVATION DATA: UPSTREAM(FEET) = 1600.00 DOWNSTREAM(FEET) = 1580.00
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL LENGTH THRU SUBAREA (FEET) = 218.02 CHANNEL SLOPE = 0.0917
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                           SCS
                                                                             LAND USE
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         MOBILE HOME PARK
                                                                                            В
                                                                                                    4.09 0.75
                                                                                                                    0.250
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             21.99
                                                                         PUBLIC PARK
                                                                                             B
                                                                                                    1.15
                                                                                                             0.75
                                                                                                                    0.850
                                                                                                                           56
 FLOW VELOCITY (FEET/SEC.) = 4.40 FLOW DEPTH (FEET) = 0.58
                                                                         RESIDENTIAL
 TRAVEL TIME (MIN.) = 0.83 Tc (MIN.) = 8.72
                                                                          "3-4 DWELLINGS/ACRE" B 0.11 0.75 0.600
                                                                                                                           56
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20842.00 = 926.16 FEET.
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.386
******************
                                                                         SUBAREA AREA(ACRES) = 5.35
                                                                                                     SUBAREA RUNOFF (CFS) = 10.18
 FLOW PROCESS FROM NODE 20842.00 TO NODE 20842.00 IS CODE = 81
                                                                         EFFECTIVE AREA(ACRES) = 24.08 AREA-AVERAGED Fm(INCH/HR) = 0.26
...........
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                         TOTAL AREA(ACRES) = 24.1
                                                                                                    PEAK FLOW RATE(CFS) =
                                                                                                                            46.55
______
 MAINLINE Tc(MIN.) = 8.72
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.544
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        ******************
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         FLOW PROCESS FROM NODE 20843.00 TO NODE 20844.00 IS CODE = 54
 MOBILE HOME PARK
                    В
                           3.16 0.75
                                            0.250
 RESIDENTIAL
                                                                         >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "5-7 DWELLINGS/ACRE" B
                            2.28
                                            0.500
                                     0.75
                                                   56
                                                                         >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 RESIDENTIAL
                                                                        ______
 "3-4 DWELLINGS/ACRE"
                      В
                            1.36
                                     0.75
                                            0.600
                                                  56
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1560.00 DOWNSTREAM(FEET) = 1557.00
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 185.64 CHANNEL SLOPE = 0.0162
                                                  56
 COMMERCIAL
                      В
                            1.50
                                     0.75
                                            0.100
 PUBLIC PARK
                      В
                             0.63
                                     0.75
                                            0.850
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.384
                                                                         CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                      46.55
 SUBAREA AREA(ACRES) = 8.93
                            SUBAREA RUNOFF (CFS) = 18.14
                                                                         FLOW VELOCITY (FEET/SEC.) = 2.74 FLOW DEPTH (FEET) = 1.06
 EFFECTIVE AREA(ACRES) = 18.73 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                         TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 10.72
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
                                                                         LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20844.00 = 1360.79 FEET.
 TOTAL AREA(ACRES) = 18.7 PEAK FLOW RATE(CFS) =
                                                38.74
                                                                        *********************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          FLOW PROCESS FROM NODE 20844.00 TO NODE 20844.00 IS CODE = 81
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                        ______
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
*****************
                                                                        _____
 FLOW PROCESS FROM NODE 20842.00 TO NODE 20843.00 IS CODE = 54
                                                                         MAINLINE Tc(MIN.) = 10.72
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.248
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fp
                                                                                                                   Ар
                                                                                                                           SCS
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
______
                                                                             LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1560.00
                                                                         MOBILE HOME PARK
                                                                                                    2.82
                                                                                                             0.75 0.250
                                                                                             В
                                                                                                    1.93
                                                                                                             0.75 0.850
 CHANNEL LENGTH THRU SUBAREA (FEET) = 248.99 CHANNEL SLOPE = 0.0803
                                                                         PUBLIC PARK
                                                                                                                           56
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                         RESIDENTIAL
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                             B 0.39 0.75 0.600
 CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                             38.74
 FLOW VELOCITY (FEET/SEC.) = 4.78 FLOW DEPTH (FEET) = 0.74
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
 TRAVEL TIME (MIN.) = 0.87 Tc (MIN.) = 9.59
                                                                         SUBAREA AREA(ACRES) = 5.14 SUBAREA RUNOFF(CFS) = 8.66
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20843.00 = 1175.15 FEET.
                                                                         EFFECTIVE AREA(ACRES) = 29.22 AREA-AVERAGED Fm(INCH/HR) = 0.28
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37
*****************
                                                                          TOTAL AREA(ACRES) = 29.2
                                                                                                      PEAK FLOW RATE(CFS) =
 FLOW PROCESS FROM NODE 20843.00 TO NODE 20843.00 IS CODE = 81
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014

File name: LR0208ZZ.RES

Page 34

Date: 04/21/2014

File name: LR020877.RFS

Page 33

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
******************
                                                                       _____
 FLOW PROCESS FROM NODE 20844.00 TO NODE 20845.00 IS CODE = 54
                                                                         MAINLINE Tc(MIN.) = 13.84
._____
                                                                         * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.929
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                         DEVELOPMENT TYPE/
                                                                                         SCS SOIL AREA
                                                                                                           Fρ
                                                                                                                         SCS
                                                                            LAND USE
______
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1555.00
                                                                        MOBILE HOME PARK
                                                                                           B 0.82
                                                                                                            0.75
                                                                                                                   0.250
                                                                                                                          56
                                                                                                    2.06
                                                                                                            0.75
 CHANNEL LENGTH THRU SUBAREA (FEET) = 193.68 CHANNEL SLOPE = 0.0103
                                                                        PUBLIC PARK
                                                                                             В
                                                                                                                   0.850
                                                                                                                          56
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                         RESIDENTIAL
                                                                                                            0.75 0.600
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                            B
                                                                                                  0.10
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             51.86
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 FLOW VELOCITY (FEET/SEC.) = 2.39 FLOW DEPTH (FEET) = 1.20
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
 TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 12.07
                                                                         SUBAREA AREA(ACRES) = 2.98
                                                                                                    SUBAREA RUNOFF (CFS) = 3.82
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20845.00 = 1554.47 FEET.
                                                                         EFFECTIVE AREA(ACRES) = 35.07 AREA-AVERAGED Fm(INCH/HR) = 0.31
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
35.1 PEAK FLOW RATE(CFS) =
                                                                                                                          51.90
                                                                         TOTAL AREA (ACRES) =
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20845.00 IS CODE = 81
                                                                         NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
______
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 MAINLINE Tc(MIN.) = 12.07
                                                                       ******************
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.094
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 20846.00 TO NODE 20847.00 IS CODE = 54
  DEVELOPMENT TYPE/
                SCS SOIL AREA
                                 Fp
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                        >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 MOBILE HOME PARK
                   В
                            0.75
                                    0.75
                                           0.250
                                                  56
                                                                        >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                           0.850
                                                                       ______
 PUBLIC PARK
                     В
                            1.88
                                    0.75
                                                 56
 RESIDENTIAL
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1552.00 DOWNSTREAM(FEET) = 1550.00
 "3-4 DWELLINGS/ACRE"
                                                                         CHANNEL LENGTH THRU SUBAREA (FEET) = 185.20 CHANNEL SLOPE = 0.0108
                   В 0.24
                                    0.75
                                           0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
                                                                         MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 SUBAREA AREA(ACRES) = 2.87
                            SUBAREA RUNOFF (CFS) = 4.11
                                                                         CHANNEL FLOW THRU SUBAREA (CFS) =
                                                                                                     51.90
 EFFECTIVE AREA(ACRES) = 32.09 AREA-AVERAGED Fm(INCH/HR) = 0.30
                                                                         FLOW VELOCITY (FEET/SEC.) = 2.43 FLOW DEPTH (FEET) = 1.19
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.40
                                                                         TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 15.11
 TOTAL AREA (ACRES) = 32.1
                                                                         LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20847.00 = 2003.41 FEET.
                            PEAK FLOW RATE(CFS) =
                                                  51.90
                                                                       ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                         FLOW PROCESS FROM NODE 20847.00 TO NODE 20847.00 IS CODE = 81
******************
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 FLOW PROCESS FROM NODE 20845.00 TO NODE 20846.00 IS CODE = 54
                                                                       ______
                                                                         MAINLINE Tc(MIN.) = 15.11
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.830
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
                                                                         DEVELOPMENT TYPE/
                                                                                           SCS SOIL AREA
                                                                                                         Fр
                                                                                                                  αA
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1552.00
                                                                            LAND USE
                                                                                            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL LENGTH THRU SUBAREA (FEET) = 263.74 CHANNEL SLOPE = 0.0114
                                                                        MOBILE HOME PARK
                                                                                            В
                                                                                                  2.48
                                                                                                            0.75
                                                                                                                   0.250
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                        PUBLIC PARK
                                                                                                    2.79
                                                                                                            0.75
                                                                                                                   0.850
                                                                                                                          56
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                         RESIDENTIAL
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                         "3-4 DWELLINGS/ACRE" B 0.16
                                                                                                            0.75 0.600
                             51.90
 FLOW VELOCITY (FEET/SEC.) = 2.49 FLOW DEPTH (FEET) = 1.18
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TRAVEL TIME (MIN.) = 1.77 Tc (MIN.) = 13.84
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.569
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20846.00 = 1818.21 FEET.
                                                                         SUBAREA AREA(ACRES) = 5.43
                                                                                                 SUBAREA RUNOFF (CFS) = 6.87
                                                                         EFFECTIVE AREA(ACRES) = 40.50 AREA-AVERAGED Fm(INCH/HR) = 0.33
*******************
                                                                         AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44
 FLOW PROCESS FROM NODE 20846.00 TO NODE 20846.00 IS CODE = 81
                                                                         TOTAL AREA (ACRES) =
                                                                                             40.5
                                                                                                     PEAK FLOW RATE (CFS) =
                                                                                                                          54.70
```

Date: 04/21/2014

File name: LR0208ZZ.RES

Page 36

Date: 04/21/2014 File name: LR0208ZZ.RES Page 35

```
FLOW PROCESS FROM NODE 20849.00 TO NODE 20849.00 IS CODE = 81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                         ______
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
*****************
                                                                         ______
 FLOW PROCESS FROM NODE 20847.00 TO NODE 20848.00 IS CODE = 54
                                                                           MAINLINE Tc (MIN.) = 17.86
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.655
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                            Fp
                                                                             LAND USE
______
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1540.00
                                                                          PUBLIC PARK
                                                                                              B 1.44 0.75 0.850
 CHANNEL LENGTH THRU SUBAREA (FEET) = 371.70 CHANNEL SLOPE = 0.0269
                                                                                              B 0.53 0.75 0.250
                                                                          MOBILE HOME PARK
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE" B 0.02 0.75 0.600
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              54.70
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 FLOW VELOCITY (FEET/SEC.) = 3.47 FLOW DEPTH (FEET) = 1.03
 TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 16.89
                                                                           SUBAREA AREA(ACRES) = 1.99 SUBAREA RUNOFF(CFS) =
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20848.00 = 2375.11 FEET.
                                                                           EFFECTIVE AREA(ACRES) = 48.35 AREA-AVERAGED Fm(INCH/HR) = 0.37
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
********************
                                                                           TOTAL AREA(ACRES) = 48.4
                                                                                                        PEAK FLOW RATE(CFS) =
 FLOW PROCESS FROM NODE 20848.00 TO NODE 20848.00 IS CODE = 81
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
______
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 MAINLINE Tc(MIN.) = 16.89
                                                                         **********************
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.711
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           FLOW PROCESS FROM NODE 20849.00 TO NODE 20850.00 IS CODE = 63
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Ap SCS
                                                                         ______
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                          >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 MOBILE HOME PARK
                    В
                           0.62
                                   0.75
                                           0.250 56
                                                                          >>>> (STREET TABLE SECTION # 5 USED) <<<<
                     В
                             5.12
                                   0.75
                                            0.850 56
                                                                         _____
 PUBLIC PARK
 RESIDENTIAL
                                                                           UPSTREAM ELEVATION(FEET) = 1510.00 DOWNSTREAM ELEVATION(FEET) = 1497.00
 "3-4 DWELLINGS/ACRE" B 0.12
                                     0.75
                                            0.600
                                                                           STREET LENGTH (FEET) = 288.19 CURB HEIGHT (INCHES) = 6.0
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.781
 SUBAREA AREA (ACRES) = 5.86 SUBAREA RUNOFF (CFS) = 5.94
                                                                           DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 EFFECTIVE AREA(ACRES) = 46.36 AREA-AVERAGED Fm(INCH/HR) = 0.36
                                                                           INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
                                                                           OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA(ACRES) = 46.4
                            PEAK FLOW RATE(CFS) =
                                                    56.32
                                                                           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
                                                                           Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                           Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
******************
                                                                           MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
 FLOW PROCESS FROM NODE 20848.00 TO NODE 20849.00 IS CODE = 54
______
                                                                            **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                            ***STREET FLOWING FULL***
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                            STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                            STREET FLOW DEPTH (FEET) = 0.56
 ELEVATION DATA: UPSTREAM(FEET) = 1540.00 DOWNSTREAM(FEET) = 1510.00
                                                                            HALFSTREET FLOOD WIDTH (FEET) = 21.06
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.67 CHANNEL SLOPE = 0.0924
                                                                            AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.90
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
                                                                            PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.88
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
                                                                           STREET FLOW TRAVEL TIME (MIN.) = 0.70 Tc (MIN.) = 18.56
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.617
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              56.32
 FLOW VELOCITY (FEET/SEC.) = 5.57 FLOW DEPTH (FEET) = 0.82
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 TRAVEL TIME (MIN.) = 0.97 Tc (MIN.) = 17.86
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fρ
 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20849.00 = 2699.78 FEET.
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           RESIDENTIAL
```

Date: 04/21/2014 File name: LR020877.RFS Page 37 Date: 04/21/2014 File name: LR0208ZZ.RES

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Page 38

66.33

SCS

56

56.32

"3-4 DWELLINGS/ACRE" B 1.94 0.75 0.600 56  MOBILE HOME PARK B 9.09 0.75 0.250 56  AGRICULTURAL FAIR COVER  "ORCHARDS" B 5.99 0.63 1.000 65  PUBLIC PARK B 1.08 0.75 0.850 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.68  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.572  SUBAREA AREA (ACRES) = 18.10 SUBAREA RUNOFF(CFS) = 20.02  EFFECTIVE AREA (ACRES) = 66.45 AREA-AVERAGED Fm(INCH/HR) = 0.37  AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.51	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.559 SUBAREA AREA(ACRES) = 93.25 SUBAREA RUNOFF(CFS) = 77.42 EFFECTIVE AREA(ACRES) = 159.70 AREA-AVERAGED Fm(INCH/HR) = 0.40 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54 TOTAL AREA(ACRES) = 159.7 PEAK FLOW RATE(CFS) = 135.26  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
TOTAL AREA (ACRES) = 66.5 PEAK FLOW RATE (CFS) = 74.39  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH (FEET) = 0.58 HALFSTREET FLOOD WIDTH (FEET) = 21.92	END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.76
**FLOW VELOCITY (FEET/SEC.) = 7.19 DEPTH*VELOCITY (FT*FT/SEC.) = 4.16  **NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,  AND L = 288.2 FT WITH ELEVATION-DROP = 13.0 FT, IS 45.5 CFS,  WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20850.00  LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20850.00 = 2987.97 FEET.	**************************************
**************************************	UPSTREAM NODE ELEVATION(FEET) = 1435.00  DOWNSTREAM NODE ELEVATION(FEET) = 1413.00  FLOW LENGTH(FEET) = 1025.18 MANNING'S N = 0.013
UPSTREAM ELEVATION(FEET) = 1497.00 DOWNSTREAM ELEVATION(FEET) = 1435.00 STREET LENGTH(FEET) = 2619.33 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 54.0 INCH PIPE IS 26.0 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 17.83 PIPE-FLOW (CFS) = 135.26 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PIPEFLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 26.33 LONGEST FLOWPATH FROM NODE 20840.00 TO NODE 20852.00 = 6632.48 FEET. ***********************************
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.86  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 113.35  ***STREET FLOWING FULL***  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.12  AVERAGE FLOW VELOCITY(FEET/SEC.) = 6.41  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.63  STREET FLOW TRAVEL TIME(MIN.) = 6.81 Tc(MIN.) = 25.37  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.341  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 82.38 0.75 0.600 56  MOBILE HOME PARK B 10.87 0.75 0.250 56	FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 81  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>  ***  MAINLINE TC (MIN.) = 26.33  *** 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.311  SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 12.28 0.75 0.600 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.600  SUBAREA AREA (ACRES) = 12.28 SUBAREA RUNOFF (CFS) = 9.53  EFFECTIVE AREA (ACRES) = 171.98 AREA-AVERAGED FM (INCH/HR) = 0.40  AREA-AVERAGED FP (INCH/HR) = 0.74 AREA-AVERAGED FM (INCH/HR) = 0.40  TOTAL AREA (ACRES) = 172.0 PEAK FLOW RATE (CFS) = 140.56  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82

Page 39

Date: 04/21/2014

File name: LR0208ZZ.RES

Date: 04/21/2014 File name: LR0208ZZ.RES Page 40

```
FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<
_____
 TOTAL NUMBER OF STREAMS = 3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.33
 RAINFALL INTENSITY (INCH/HR) = 1.31
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.54
 EFFECTIVE STREAM AREA(ACRES) = 171.98
 TOTAL STREAM AREA(ACRES) = 171.98
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
                      AREA
 STREAM
         0
                Tc
                                HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                 NODE
         1447.52 44.99
   1
                       2763.54 20620.00
         86.96 12.81
                         57.40
                                20830.00
         140.56 26.33
                       171.98 20840.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.94;24H= 3.94
 S-GRAPH: VALLEY(DEV.) = 92.4%; VALLEY(UNDEV.)/DESERT= 7.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.49; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.87; 30M = 0.87; 1HR = 0.87;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) =
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0326; Lca/L=0.4,n=.0293; Lca/L=0.5,n=.0269; Lca/L=0.6,n=.0251
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) =
 PEAK FLOW RATE (CFS) = 1554.74
*********************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 20852.DNA
______
 END OF STUDY SUMMARY:
                       2992.9 TC(MIN.) =
 TOTAL AREA (ACRES) =
                                         44.99
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.58
 PEAK FLOW RATE (CFS) = 1554.74
_____
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Date: 04/21/2014 File name: LR0208ZZ.RES Page 41 Date: 04/21/2014 File name: LR0208ZZ.RES Page 42

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20968

16 12.5

5.0

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0209ZZ.DAT

TIME/DATE OF STUDY: 08:01 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR NO. (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) (n) 1 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

2 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 22.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15.0 15.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 15.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 10.0 0.67 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 30.0 2.00 0.0312 0.167 0.0180 10 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 12 24.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 0.67 2.00 0.0312 0.167 0.0180 14 20.0 0.020/0.020/0.020 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

0.020/0.020/0.020 0.50

Date: 04/21/2014 File name: LR020977.RFS Page 1

1.50 0.0312 0.125 0.0180

17 20.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 10.0 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180

## GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

1. Relative Flow-Depth = 0.20 FEET

as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)

2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN

OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF

1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH

FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE.

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20900.00 TO NODE 20901.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 751.64

ELEVATION DATA: UPSTREAM(FEET) = 1840.00 DOWNSTREAM(FEET) = 1798.00

\_\_\_\_\_

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.372

\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.293

SUBAREA To AND LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
RESIDENTIAL						
".4 DWELLING/ACRE"	В	0.85	0.75	0.900	56	12.26
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	В	0.85	0.75	0.600	56	10.37
RESIDENTIAL						
"2 DWELLINGS/ACRE"	В	8.78	0.75	0.700	56	11.03

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.708

SUBAREA RUNOFF (CFS) = 16.63

TOTAL AREA (ACRES) = 10.48 PEAK FLOW RATE (CFS) =

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

FLOW PROCESS FROM NODE 20901.00 TO NODE 20902.00 IS CODE = 63

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<

>>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014

\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1798.00 DOWNSTREAM ELEVATION(FEET) = 1770.00

File name: LR020977.RFS

Page 2

```
STREET LENGTH (FEET) = 427.68 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                   STREET FLOW DEPTH (FEET) = 0.47
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 17.34
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.65
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.16
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.97
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.86 Tc (MIN.) = 13.52
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 20.43
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.956
   STREET FLOW DEPTH (FEET) = 0.39
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   HALFSTREET FLOOD WIDTH (FEET) = 13.12
                                                                                  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                      Fρ
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.56
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                      LAND USE
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.16
                                                                                  RESIDENTIAL
                                                                                  ".4 DWELLING/ACRE" B 2.12
 STREET FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 11.65
                                                                                                                         0.75
                                                                                                                                 0.900
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.138
                                                                                  RESIDENTIAL.
                                                                                 "3-4 DWELLINGS/ACRE" B 0.54 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                                 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
                                                                                  RESIDENTIAL
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  "2 DWELLINGS/ACRE" B 2.53 0.75 0.700
     LAND USE
 RESIDENTIAL
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 ".4 DWELLING/ACRE" B 2.43
                                         0.75
                                                 0.900
                                                       56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.771
                                                                                  SUBAREA AREA (ACRES) = 5.19 SUBAREA RUNOFF (CFS) = 6.44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.53
                                         0.75
                                                 0.600
                                                       56
                                                                                  EFFECTIVE AREA(ACRES) = 21.09 AREA-AVERAGED Fm(INCH/HR) = 0.56
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 RESIDENTIAL
                      B 2.46 0.75 0.700 56
                                                                                  TOTAL AREA (ACRES) = 21.1 PEAK FLOW RATE (CFS) =
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.780
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA (ACRES) = 5.42 SUBAREA RUNOFF (CFS) = 7.59
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 TOTAL AREA (ACRES) = 15.9 PEAK FLOW RATE (CFS) = 22.76
                                                                                  DEPTH(FEET) = 0.48 HALFSTREET FLOOD WIDTH(FEET) = 17.49
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.18 DEPTH*VELOCITY (FT*FT/SEC.) = 1.99
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20903.00 = 1644.63 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                                ********************
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  FLOW PROCESS FROM NODE 20903.00 TO NODE 20904.00 IS CODE = 63
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.66
 FLOW VELOCITY (FEET/SEC.) = 5.73 DEPTH*VELOCITY (FT*FT/SEC.) = 2.29
                                                                                 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20902.00 = 1179.32 FEET.
                                                                                 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                ______
********************
                                                                                  UPSTREAM ELEVATION(FEET) = 1758.00 DOWNSTREAM ELEVATION(FEET) = 1750.00
 FLOW PROCESS FROM NODE 20902.00 TO NODE 20903.00 IS CODE = 63
                                                                                  STREET LENGTH (FEET) = 486.20 CURB HEIGHT (INCHES) = 6.0
______
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1758.00
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 465.31 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
```

25.98

56

56

26.59

Date: 04/21/2014 File name: LR0209ZZ.RES Page 3 Date: 04/21/2014 File name: LR0209ZZ.RES Page 4

```
***STREET FLOWING FULL***
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   ***STREET FLOWING FULL***
                                                                                    STREET FLOW DEPTH (FEET) = 0.54
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 19.78
   STREET FLOW DEPTH(FEET) = 0.56
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.05
   HALFSTREET FLOOD WIDTH (FEET) = 20.82
                                                                                    PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.78
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.13
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 17.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.30
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.702
 STREET FLOW TRAVEL TIME (MIN.) = 1.96 Tc (MIN.) = 15.48
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.803
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         Fр
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                      LAND USE
                                                                                                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                                                                  RESIDENTIAL
     LAND USE
              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  ".4 DWELLING/ACRE" B 8.61
                                                                                                                          0.75
                                                                                                                                  0.900
                                                                                                                                          56
 RESIDENTIAL
                                                                                  RESIDENTIAL
 ".4 DWELLING/ACRE" B 3.95
                                         0.75
                                                 0.900 56
                                                                                  "3-4 DWELLINGS/ACRE" B 2.14
                                                                                                                          0.75
                                                                                                                                  0.600
                                                                                                                                          56
 RESIDENTIAL
                                                                                  RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.03
                                         0.75
                                                 0.600
                                                       56
                                                                                  "2 DWELLINGS/ACRE"
                                                                                                        B 13.33 0.75 0.700
                                                                                                                                          56
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В 15.54
                                         0.75 0.700 56
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.763
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA(ACRES) = 24.08
                                                                                                                SUBAREA RUNOFF (CFS) = 24.53
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.727
                                                                                  EFFECTIVE AREA(ACRES) = 66.69 AREA-AVERAGED Fm(INCH/HR) = 0.56
 SUBAREA AREA (ACRES) = 21.52 SUBAREA RUNOFF (CFS) = 24.39
                                                                                  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.74
 EFFECTIVE AREA(ACRES) = 42.61 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                                  TOTAL AREA (ACRES) = 66.7 PEAK FLOW RATE (CFS) =
                                                                                                                                           68.74
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
 TOTAL AREA(ACRES) = 42.6 PEAK FLOW RATE(CFS) =
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  DEPTH(FEET) = 0.55 HALFSTREET FLOOD WIDTH(FEET) = 20.70
                                                                                  FLOW VELOCITY(FEET/SEC.) = 7.39 DEPTH*VELOCITY(FT*FT/SEC.) = 4.09
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                  LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20905.00 = 2791.34 FEET.
 DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.53
 FLOW VELOCITY (FEET/SEC.) = 4.42 DEPTH*VELOCITY (FT*FT/SEC.) = 2.61
                                                                                 ******************
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 486.2 FT WITH ELEVATION-DROP = 8.0 FT, IS 32.0 CFS,
                                                                                  FLOW PROCESS FROM NODE 20905.00 TO NODE 20906.00 IS CODE = 63
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20904.00
 LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20904.00 = 2130.83 FEET.
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
*****************
                                                                                 ______
 FLOW PROCESS FROM NODE 20904.00 TO NODE 20905.00 IS CODE = 63
                                                                                  UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
______
                                                                                  STREET LENGTH (FEET) = 1223.70 CURB HEIGHT (INCHES) = 6.0
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 UPSTREAM ELEVATION(FEET) = 1750.00 DOWNSTREAM ELEVATION(FEET) = 1715.00
                                                                                  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 STREET LENGTH (FEET) = 660.51 CURB HEIGHT (INCHES) = 6.0
                                                                                  OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 76.25
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    ***STREET FLOWING FULL***
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
                                                                                    STREET FLOW DEPTH(FEET) = 0.60
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 23.02
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 60.36
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.73
```

Page 5

Date: 04/21/2014 File name: LR0209ZZ.RES

Date: 04/21/2014 File name: LR0209ZZ.RES Page 6

PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.04 STREET FLOW TRAVEL TIME(MIN.) = 3.03 Tc(MIN.) = 20.07	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.543 SUBAREA LOSS RATE DATA(AMC II):	"3-4 DWELLINGS/ACRE" B 2.66 0.75 0.600 56 RESIDENTIAL
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN	"2 DWELLINGS/ACRE" B 8.47 0.75 0.700 56 AGRICULTURAL FAIR COVER
RESIDENTIAL ".4 DWELLING/ACRE" B 7.55 0.75 0.900 56	"ORCHARDS" B 0.16 0.63 1.000 65 RESIDENTIAL
RESIDENTIAL	".4 DWELLING/ACRE" B 7.50 0.75 0.900 56
"3-4 DWELLINGS/ACRE" B 1.61 0.75 0.600 56 RESIDENTIAL	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.768
"2 DWELLINGS/ACRE" B 8.18 0.75 0.700 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.778  SUBAREA AREA (ACRES) = 17.34 SUBAREA RUNOFF(CFS) = 15.00	SUBAREA AREA(ACRES) = 18.79 SUBAREA RUNOFF(CFS) = 14.06  EFFECTIVE AREA(ACRES) = 102.82 AREA-AVERAGED Fm(INCH/HR) = 0.56  AREA-AVERAGED Fp(INCH/HR) = 0.75  TOTAL AREA(ACRES) = 102.8 PEAK FLOW RATE(CFS) = 77.80
EFFECTIVE AREA(ACRES) = 84.03 AREA-AVERAGED Fm(INCH/HR) = 0.56 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.75	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
TOTAL AREA (ACRES) = 84.0 PEAK FLOW RATE (CFS) = 74.19	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70  END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.60	END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.58
LONGEST FLOWPATH FROM NODE 20900.00 TO NODE 20906.00 = 4015.04 FEET.	FLOW PROCESS FROM NODE 20920.00 TO NODE 20920.00 IS CODE = 1
**************************************	>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE< TOTAL NUMBER OF STREAMS = 2 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE: TIME OF CONCENTRATION(MIN.) = 23.47
UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1600.00 STREET LENGTH(FEET) = 1513.04 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00	RAINFALL INTENSITY(INCH/HR) = 1.40  AREA-AVERAGED Fm(INCH/HR) = 0.56  AREA-AVERAGED Fp(INCH/HR) = 0.75  AREA-AVERAGED Ap = 0.75  EFFECTIVE STREAM AREA(ACRES) = 102.82
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020	TOTAL STREAM AREA (ACRES) = 102.82 PEAK FLOW RATE (CFS) AT CONFLUENCE = 77.80
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020	FLOW PROCESS FROM NODE 20910.00 TO NODE 20911.00 IS CODE = 21
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.71	>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<>>>> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<>
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 81.22 ***STREET FLOWING FULL***	INITIAL SUBAREA FLOW-LENGTH(FEET) = 679.60 ELEVATION DATA: UPSTREAM(FEET) = 1825.00 DOWNSTREAM(FEET) = 1795.00
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:  STREET FLOW DEPTH(FEET) = 0.59  HALFSTREET FLOOD WIDTH(FEET) = 22.59  AVERAGE FLOW VELOCITY(FEET/SEC.) = 7.43  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.39  STREET FLOW TRAVEL TIME (MIN.) = 23.40 TRAVEL TRA	Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.443  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.284  SUBAREA TC AND LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC
STREET FLOW TRAVEL TIME (MIN.) = 3.40 Tc (MIN.) = 23.47  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.405  SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS	LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) RESIDENTIAL "3-4 DWELLINGS/ACRE" B 0.59 0.75 0.600 56 10.44 RESIDENTIAL

Date: 04/21/2014

File name: LR0209ZZ.RES

Page 8

Date: 04/21/2014

File name: LR0209ZZ.RES

Page 7

```
".4 DWELLING/ACRE"
                          4.98 0.75 0.900 56 12.34
                                                                        CHANNEL FLOW THRU SUBAREA(CFS) =
                   В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.868
 SUBAREA RUNOFF(CFS) =
                   8.19
 TOTAL AREA (ACRES) = 5.57 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
************
 FLOW PROCESS FROM NODE 20911.00 TO NODE 20912.00 IS CODE = 54
_____
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1795.00 DOWNSTREAM(FEET) = 1780.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 216.45 CHANNEL SLOPE = 0.0693
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.70 FLOW DEPTH (FEET) = 0.35
 TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 11.78
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20912.00 = 896.05 FEET.
******************
 FLOW PROCESS FROM NODE 20912.00 TO NODE 20912.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 11.78
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.125
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          αA
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.20
                                    0.75
                                           0.600
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                    В 5.94
                                  0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.890
 SUBAREA AREA (ACRES) = 6.14 SUBAREA RUNOFF (CFS) = 8.06
 EFFECTIVE AREA(ACRES) = 11.71 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 11.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
FLOW PROCESS FROM NODE 20912.00 TO NODE 20913.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1780.00 DOWNSTREAM(FEET) = 1770.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 292.78 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 25.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
```

```
15.46
 FLOW VELOCITY (FEET/SEC.) = 2.41 FLOW DEPTH (FEET) = 0.51
 TRAVEL TIME (MIN.) = 2.02 Tc (MIN.) = 13.80
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20913.00 = 1188.83 FEET.
FLOW PROCESS FROM NODE 20913.00 TO NODE 20913.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 13.80
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.932
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                          Ар
                                                SCS
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.69 0.75 0.600
                                                 56
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                   B 9.60 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA (ACRES) = 10.29 SUBAREA RUNOFF (CFS) = 11.80
 EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.66
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA(ACRES) = 22.0
                            PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
FLOW PROCESS FROM NODE 20913.00 TO NODE 20914.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1740.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 493.77 CHANNEL SLOPE = 0.0608
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.90 FLOW DEPTH (FEET) = 0.42
 TRAVEL TIME (MIN.) = 2.83 Tc (MIN.) = 16.63
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20914.00 = 1682.60 FEET.
******************
 FLOW PROCESS FROM NODE 20914.00 TO NODE 20914.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.63
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.727
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                  в 8.27
                                   0.75
                                          0.900
                                                 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           0.58
                                   0.75
                                          0.600
                                               56
      Date: 04/21/2014
                   File name: LR0209ZZ.RES
                                               Page 10
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 9

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                            STREET HALFWIDTH (FEET) = 18.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.880
 SUBAREA AREA(ACRES) = 8.85
                             SUBAREA RUNOFF(CFS) = 8.51
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 EFFECTIVE AREA(ACRES) = 30.85 AREA-AVERAGED Fm(INCH/HR) = 0.66
                                                                            INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 30.9 PEAK FLOW RATE (CFS) =
                                                     29.69
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
******************
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
 FLOW PROCESS FROM NODE 20914.00 TO NODE 20915.00 IS CODE = 54
                                                                              **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                            37.22
                                                                              ***STREET FLOWING FULL***
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                              STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                              STREET FLOW DEPTH (FEET) = 0.51
 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1720.00
                                                                              HALFSTREET FLOOD WIDTH (FEET) = 18.50
 CHANNEL LENGTH THRU SUBAREA (FEET) = 642.16 CHANNEL SLOPE = 0.0311
                                                                              AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.91
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                              PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.50
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 2.32 Tc (MIN.) = 23.58
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              29.69
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.401
 FLOW VELOCITY (FEET/SEC.) = 2.32 FLOW DEPTH (FEET) = 0.51
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 TRAVEL TIME (MIN.) = 4.62 Tc (MIN.) = 21.26
                                                                                                              Fр
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                        αA
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20915.00 = 2324.76 FEET.
                                                                                LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            RESIDENTIAL
*************************
                                                                             "3-4 DWELLINGS/ACRE" B 1.86
                                                                                                                  0.75
                                                                                                                         0.600
 FLOW PROCESS FROM NODE 20915.00 TO NODE 20915.00 IS CODE = 81
                                                                            RESIDENTIAL
                                                                            ".4 DWELLING/ACRE"
______
                                                                                                B 20.51 0.75 0.900
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.875
                                                                            SUBAREA AREA (ACRES) = 22.37 SUBAREA RUNOFF (CFS) = 15.03
 MAINLINE Tc(MIN.) = 21.26
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.491
                                                                            EFFECTIVE AREA (ACRES) = 57.35 AREA-AVERAGED Fm(INCH/HR) = 0.66
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                            TOTAL AREA (ACRES) = 57.3 PEAK FLOW RATE (CFS) =
                                     Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 ".4 DWELLING/ACRE"
                     В 3.54
                                   0.75 0.900
                                                   56
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.59
                                   0.75 0.600
                                                                            END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                            DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.74
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.857
                                                                            FLOW VELOCITY (FEET/SEC.) = 4.96 DEPTH*VELOCITY (FT*FT/SEC.) = 2.55
                                                                            LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20916.00 = 3008.72 FEET.
 SUBAREA AREA(ACRES) = 4.13
                             SUBAREA RUNOFF (CFS) = 3.16
 EFFECTIVE AREA(ACRES) = 34.98 AREA-AVERAGED Fm(INCH/HR) = 0.66
                                                                           ******************
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.88
 TOTAL AREA (ACRES) = 35.0 PEAK FLOW RATE (CFS) =
                                                                            FLOW PROCESS FROM NODE 20916.00 TO NODE 20917.00 IS CODE = 63
                                                     29.69
                                                                           ______
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                            >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                            >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                           _____
                                                                            UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1672.00
******************
                                                                            STREET LENGTH (FEET) = 576.79 CURB HEIGHT (INCHES) = 6.0
 FLOW PROCESS FROM NODE 20915.00 TO NODE 20916.00 IS CODE = 63
                                                                            STREET HALFWIDTH (FEET) = 18.00
______
                                                                            DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                            OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
 UPSTREAM ELEVATION(FEET) = 1720.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 STREET LENGTH (FEET) = 683.96 CURB HEIGHT (INCHES) = 6.0
                                                                            SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

Page 11

Date: 04/21/2014

File name: LR0209ZZ.RES

Date: 04/21/2014 File name: LR0209ZZ.RES Page 12

SCS

56

56

38.48

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                44.75
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.50
   HALFSTREET FLOOD WIDTH (FEET) = 18.07
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.09
 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 25.14
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.348
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Αp
                                                       SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.43 0.75 0.600 56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 16.04 0.75 0.900 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.847
 SUBAREA AREA(ACRES) = 19.47 SUBAREA RUNOFF(CFS) = 12.52
 EFFECTIVE AREA(ACRES) = 76.82 AREA-AVERAGED Fm(INCH/HR) = 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.87
 TOTAL AREA (ACRES) = 76.8 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.56
 FLOW VELOCITY (FEET/SEC.) = 6.33 DEPTH*VELOCITY (FT*FT/SEC.) = 3.24
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20917.00 = 3585.51 FEET.
*****
 FLOW PROCESS FROM NODE 20917.00 TO NODE 20918.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1672.00 DOWNSTREAM ELEVATION(FEET) = 1655.00
 STREET LENGTH (FEET) = 727.03 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.89
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.82
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.02
 STREET FLOW TRAVEL TIME (MIN.) = 2.51 Tc (MIN.) = 27.65
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.273
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                                 Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.63 0.75 0.600
                                                        56
 RESIDENTIAL
 ".4 DWELLING/ACRE" B 5.91 0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.696
 SUBAREA AREA (ACRES) = 18.54 SUBAREA RUNOFF (CFS) = 12.56
 EFFECTIVE AREA(ACRES) = 95.36 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 95.4 PEAK FLOW RATE (CFS) = 55.66
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.57
 FLOW VELOCITY (FEET/SEC.) = 4.84 DEPTH*VELOCITY (FT*FT/SEC.) = 3.05
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20918.00 = 4312.54 FEET.
*******************
 FLOW PROCESS FROM NODE 20918.00 TO NODE 20919.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1655.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 577.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.69
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.22
 STREET FLOW TRAVEL TIME (MIN.) = 1.89 Tc (MIN.) = 29.54
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.224
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 13 Date: 04/21/2014 File name: LR0209ZZ.RES Page 14

```
LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B
                                9.91
                                         0.75
                                                 0.600
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                                0.10
                                      0.63 1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.604
 SUBAREA AREA(ACRES) = 10.01
                               SUBAREA RUNOFF (CFS) = 6.97
 EFFECTIVE AREA(ACRES) = 105.37 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.81
 TOTAL AREA(ACRES) = 105.4 PEAK FLOW RATE(CFS) =
                                                          58.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.57
 FLOW VELOCITY (FEET/SEC.) = 5.08 DEPTH*VELOCITY (FT*FT/SEC.) = 3.20
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20919.00 = 4890.04 FEET.
******************
 FLOW PROCESS FROM NODE 20919.00 TO NODE 20920.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 1346.52 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.61
 STREET FLOW TRAVEL TIME (MIN.) = 4.03 Tc (MIN.) = 33.57
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.134
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
                                        Fρ
                                                 αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                              4.53
                                         0.75
                                                 0.600
                                                       56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                        В
                               10.24
                                         0.63
                                                 1.000
                                                         65
 RESIDENTIAL
 ".4 DWELLING/ACRE"
                        В
                                33.53
                                         0.75
                                                 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
```

File name: LR020977.RFS

Page 15

Date: 04/21/2014

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.893
 SUBAREA AREA(ACRES) = 48.30
                              SUBAREA RUNOFF (CFS) = 21.32
 EFFECTIVE AREA(ACRES) = 153.67 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.84
 TOTAL AREA (ACRES) = 153.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.80
 FLOW VELOCITY (FEET/SEC.) = 5.61 DEPTH*VELOCITY (FT*FT/SEC.) = 3.67
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20920.00 = 6236.56 FEET.
**********************
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20920.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 33.57
 RAINFALL INTENSITY (INCH/HR) = 1.13
 AREA-AVERAGED Fm(INCH/HR) = 0.62
 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.84
 EFFECTIVE STREAM AREA(ACRES) = 153.67
 TOTAL STREAM AREA(ACRES) = 153.67
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm)
                                                     HEADWATER
                                             Ae
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                             (ACRES) NODE
   1
           77.80 23.47 1.405 0.75(0.56) 0.75 102.8 20900.00
    2
           71.14 33.57 1.134 0.74(0.62) 0.84 153.7 20910.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          148.94 23.47 1.405 0.74(0.59) 0.80 210.3 20900.00
          123.82 33.57 1.134 0.74(0.60) 0.80 256.5 20910.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 148.94 Tc (MIN.) = 23.47
 EFFECTIVE AREA(ACRES) = 210.27 AREA-AVERAGED Fm(INCH/HR) = 0.59
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 256.5
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20920.00 = 6236.56 FEET.
******************
 FLOW PROCESS FROM NODE 20920.00 TO NODE 20921.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 16

LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20921.00 = 7002.65 FEET. \_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1600.00 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* DOWNSTREAM NODE ELEVATION (FEET) = 1580.00 FLOW LENGTH (FEET) = 766.09 MANNING'S N = 0.013FLOW PROCESS FROM NODE 20921.00 TO NODE 20922.00 IS CODE = 42 \_\_\_\_\_ USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< DEPTH OF FLOW IN 57.0 INCH PIPE IS 25.3 INCHES >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << PIPE-FLOW VELOCITY(FEET/SEC.) = 19.63------PIPE-FLOW(CFS) = 148.94UPSTREAM NODE ELEVATION (FEET) = 1580.00 \*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* DOWNSTREAM NODE ELEVATION (FEET) = 1560.00 PIPEFLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 24.16 FLOW LENGTH (FEET) = 1453.35 MANNING'S N = 0.013\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.381 SUBAREA LOSS RATE DATA (AMC II): USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 75.0 INCH PIPE IS 31.3 INCHES DEVELOPMENT TYPE/ SCS SOIL AREA Fρ Αр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN PIPE-FLOW VELOCITY (FEET/SEC.) = 16.64 PIPE-FLOW(CFS) = 202.18AGRICULTURAL FAIR COVER "ORCHARDS" В 0.05 0.63 1.000 65 \*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* RESIDENTIAL PIPEFLOW TRAVEL TIME (MIN.) = 1.46 Tc (MIN.) = 25.62 "3-4 DWELLINGS/ACRE" B 11.48 0.75 0.600 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20922.00 = 8456.00 FEET. RESIDENTIAL "2 DWELLINGS/ACRE" В 56.14 0.75 0.700 56 \* SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 FLOW PROCESS FROM NODE 20922.00 TO NODE 20922.00 IS CODE = 81 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683 \_\_\_\_\_\_ SUBAREA AREA(ACRES) = 67.67 SUBAREA RUNOFF(CFS) = 52.97 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< EFFECTIVE AREA(ACRES) = 277.94 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.77 MAINLINE Tc(MIN.) = 25.62TOTAL AREA (ACRES) = 324.2 PEAK FLOW RATE (CFS) = \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.333 SUBAREA LOSS RATE DATA (AMC II): SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): DEVELOPMENT TYPE/ SCS SOIL AREA Fр LAND USE 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL STREET CROSS-SECTION INFORMATION: "3-4 DWELLINGS/ACRE" B 10.56 0.75 0.600 56 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00 RESIDENTIAL DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00 "2 DWELLINGS/ACRE" B 31.42 0.75 0.700 56 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 RESIDENTIAL OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 "5-7 DWELLINGS/ACRE" B 17.53 0.75 0.500 56 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 MOBILE HOME PARK B 16.71 0.75 0.250 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.84 COMMERCIAL 2.07 0.75 0.100 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.530 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 SUBAREA AREA (ACRES) = 78.29 SUBAREA RUNOFF (CFS) = 66.01 EFFECTIVE AREA(ACRES) = 356.23 AREA-AVERAGED Fm(INCH/HR) = 0.61 STREETFLOW HYDRAULICS BASED ON MAINLINE To : AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.83STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 53.24 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: TOTAL AREA (ACRES) = 402.4 PEAK FLOW RATE(CFS) = STREET FLOW DEPTH (FEET) = 0.61HALFSTREET FLOOD WIDTH (FEET) = 22.69 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.99 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 3.05 \*\* PEAK FLOW RATE TABLE \*\* \*\* PEAK FLOW RATE TABLE \*\* STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER STREAM Q Tc Intensity Fp(Fm) Ap Аe HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 255.38 25.71 1.330 0.74(0.53) 0.72 356.2 20900.00 1 1 202.18 24.16 1.381 0.74(0.57) 0.77 277.9 20900.00 197.17 35.94 1.088 0.74(0.54) 0.73 402.4 20910.00 157.52 34.29 1.119 0.74(0.58) 0.78 324.2 20910.00 NEW PEAK FLOW DATA ARE: NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 255.38 Tc (MIN.) = 25.71PEAK FLOW RATE (CFS) = 202.18 Tc (MIN.) = 24.16 AREA-AVERAGED Fm(INCH/HR) = 0.53 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Fm(INCH/HR) = 0.57 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.72 EFFECTIVE AREA(ACRES) = AREA-AVERAGED Ap = 0.77 EFFECTIVE AREA(ACRES) = 277.94

Date: 04/21/2014

File name: LR0209ZZ.RES

Page 18

Date: 04/21/2014 File name: LR0209ZZ.RES Page 17

```
*******************
 FLOW PROCESS FROM NODE 20922.00 TO NODE 20923.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1490.00
 FLOW LENGTH (FEET) = 1505.73 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 28.4 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.92
 PIPE-FLOW(CFS) = 255.38
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 26.66
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.302
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B
                              6.04
                                        0.75
                                                0.500
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 30.00
                                        0.75
                                               0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
 SUBAREA AREA(ACRES) = 36.04
                            SUBAREA RUNOFF (CFS) = 28.07
 EFFECTIVE AREA(ACRES) = 392.27 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 438.5 PEAK FLOW RATE(CFS) =
                                                        274.21
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.69
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 18.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.91
 ** PEAK FLOW RATE TABLE **
           Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          274.21 26.66 1.302 0.74(0.52) 0.70 392.3 20900.00
    2
          211.15 36.96 1.070 0.74(0.53) 0.72 438.5 20910.00
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.52 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED AD = 0.70 EFFECTIVE AREA(ACRES) = 392.27
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20923.00 = 9961.73 FEET.
FLOW PROCESS FROM NODE 20923.00 TO NODE 20924.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1440.00
 FLOW LENGTH (FEET) = 1358.44 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 FLOWDEPTH IN BOX IS 2.99 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 22.96
 BOX-FLOW(CFS) = 274.21
 BOX-FLOW TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 27.65
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20924.00 = 11320.17 FEET.
******************
 FLOW PROCESS FROM NODE 20924.00 TO NODE 20924.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_______
 MAINLINE Tc (MIN.) = 27.65
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.273
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 6.19
                                   0.75
                                           0.500
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 35.81
                                    0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.585
 SUBAREA AREA(ACRES) = 42.00 SUBAREA RUNOFF(CFS) = 31.59
 EFFECTIVE AREA(ACRES) = 434.27 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 480.5
                             PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm)
                                          Ae
                                                 HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
         296.55 27.59 1.275 0.75(0.52)0.69 434.3 20900.00
         228.26 37.89 1.054 0.74(0.53) 0.71 480.5 20910.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 296.55 Tc (MIN.) = 27.59
 AREA-AVERAGED Fm (INCH/HR) = 0.52 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69 EFFECTIVE AREA(ACRES) =
******************
 FLOW PROCESS FROM NODE 20924.00 TO NODE 20939.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
```

File name: LR0209ZZ.RES

Page 20

Date: 04/21/2014

PEAK FLOW RATE (CFS) = 274.21 Tc (MIN.) = 26.66

Date: 04/21/2014 File name: LR0209ZZ.RES Page 19

NEW PEAK FLOW DATA ARE:

```
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 1153.84 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 4.46
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.62
 BOX-FLOW(CFS) = 296.55
 BOX-FLOW TRAVEL TIME (MIN.) = 1.16 Tc (MIN.) = 28.74
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
******************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 28.74
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.244
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          qΑ
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                  В
                          2.86
                                    0.75
                                           0.500 56
 SCHOOL
                    В
                           0.48
                                    0.75
                                           0.600 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 11.63
                                  0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.581
 SUBAREA AREA (ACRES) = 14.97 SUBAREA RUNOFF (CFS) = 10.91
 EFFECTIVE AREA(ACRES) = 449.24 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 495.5 PEAK FLOW RATE (CFS) = 296.55
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
********************
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 28.74
 RAINFALL INTENSITY (INCH/HR) = 1.24
 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 449.24
 TOTAL STREAM AREA(ACRES) = 495.46
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 296.55
******************
 FLOW PROCESS FROM NODE 20930.00 TO NODE 20931.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
INITIAL SUBAREA FLOW-LENGTH (FEET) = 975.69
 ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.455
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.962
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                Αp
                                                       SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.68 0.75 0.600 56 13.46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 11.82
 TOTAL AREA(ACRES) = 8.68 PEAK FLOW RATE(CFS) = 11.82
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
*******************
 FLOW PROCESS FROM NODE 20931.00 TO NODE 20932.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 500.18 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 12.78
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.72
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.41
 STREET FLOW TRAVEL TIME (MIN.) = 2.24 Tc (MIN.) = 15.70
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.789
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.59 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 1.59 SUBAREA RUNOFF (CFS) = 1.92
 EFFECTIVE AREA(ACRES) = 10.27 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 10.3 PEAK FLOW RATE(CFS) = 12.38
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 21 Date: 04/21/2014 File name: LR0209ZZ.RES Page 22

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 12.49
 FLOW VELOCITY (FEET/SEC.) = 3.69 DEPTH*VELOCITY (FT*FT/SEC.) = 1.39
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20932.00 = 1475.87 FEET.
************************
 FLOW PROCESS FROM NODE 20932.00 TO NODE 20933.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1560.00
 STREET LENGTH (FEET) = 1367.05 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     29.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.47
   HALFSTREET FLOOD WIDTH (FEET) = 17.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.88
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.29
 STREET FLOW TRAVEL TIME (MIN.) = 4.66 Tc (MIN.) = 20.36
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.530
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                   Aρ
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             12.11
                                          0.75
                                                  0.600 56
                         В 22.59
 SCHOOL
                                        0.75
                                                  0.600
 PUBLIC PARK
                                1.47
                                                  0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.610
 SUBAREA AREA(ACRES) = 36.17
                                SUBAREA RUNOFF(CFS) = 34.95
 EFFECTIVE AREA(ACRES) = 46.44 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 46.4 PEAK FLOW RATE (CFS) = 44.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 19.05
 FLOW VELOCITY (FEET/SEC.) = 5.62 DEPTH*VELOCITY (FT*FT/SEC.) = 2.93
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
```

```
AND L = 1367.1 FT WITH ELEVATION-DROP = 50.0 FT, IS 46.6 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20933.00
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20933.00 = 2842.92 FEET.
**********************
 FLOW PROCESS FROM NODE 20933.00 TO NODE 20934.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 UPSTREAM NODE ELEVATION (FEET) = 1560.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1510.00
 FLOW LENGTH (FEET) = 1450.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 14.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.97
 PIPE-FLOW(CFS) =
                  44.94
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.51 Tc (MIN.) = 21.87
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20934.00 = 4292.92 FEET.
******************
 FLOW PROCESS FROM NODE 20934.00 TO NODE 20934.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 21.87
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.466
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 26.74
                                     0.75
                                            0.600
                                                    56
                           9.16
                                     0.75
                                            0.850
                                                   56
 PUBLIC PARK
                    В
 SCHOOL
                      В
                             6.76
                                     0.75
                                            0.600
                                                    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                    B 6.64
                                     0.63
                                            1.000
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                  в 2.77
                                     0.75 0.700
                                                    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 52.07 SUBAREA RUNOFF(CFS) = 44.84
 EFFECTIVE AREA(ACRES) = 98.51 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.66
 TOTAL AREA (ACRES) = 98.5 PEAK FLOW RATE (CFS) =
                                                 87.09
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
******************
 FLOW PROCESS FROM NODE 20934.00 TO NODE 20935.00 IS CODE = 42
.....
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_______
 UPSTREAM NODE ELEVATION (FEET) = 1510.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1485.00
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 24

Date: 04/21/2014 File name: LR0209ZZ.RES Page 23

```
FLOW LENGTH (FEET) = 871.47 MANNING'S N = 0.013
                                                                         RESIDENTIAL
                                                                         "3-4 DWELLINGS/ACRE"
                                                                                              В
                                                                                                 101.89
                                                                                                             0.75
                                                                                                                    0.600
                                                                                                                           56
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
                                                                         COMMERCIAL
                                                                                             В 1.19
                                                                                                             0.75
                                                                                                                    0.100
                                                                                                                           56
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 18.8 INCHES
                                                                         MOBILE HOME PARK
                                                                                            B 18.61
                                                                                                             0.75
                                                                                                                    0.250
                                                                                                                           56
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.63
                                                                         RESIDENTIAL
                                                                                            в 2.78 0.75 0.500
 PIPE-FLOW(CFS) = 87.09
                                                                         "5-7 DWELLINGS/ACRE"
                                                                                                                           56
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 22.70
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.541
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20935.00 = 5164.39 FEET.
                                                                         SUBAREA AREA (ACRES) = 124.47 SUBAREA RUNOFF (CFS) = 111.99
                                                                         EFFECTIVE AREA(ACRES) = 299.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
******************
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61
                                                                         TOTAL AREA (ACRES) = 299.0 PEAK FLOW RATE (CFS) =
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20935.00 IS CODE = 81
                                                                                                                        257.59
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 MAINLINE TC (MIN.) = 22.70
                                                                        ******************
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.433
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 20936.00 TO NODE 20937.00 IS CODE = 48
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                          qΑ
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
     LAND USE
 RESIDENTIAL
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                        ______
 "3-4 DWELLINGS/ACRE" B 67.33
                                    0.75
                                            0.600
                                                 56
 AGRICULTURAL FAIR COVER
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1465.00 DOWNSTREAM(FEET) = 1440.00
                           8.70 0.63
 "ORCHARDS"
                    В
                                          1.000
                                                                         FLOW LENGTH (FEET) = 712.54 MANNING'S N = 0.014
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                         GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                         FLOWDEPTH IN BOX IS 2.90 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 22.23
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
 SUBAREA AREA(ACRES) = 76.03
                           SUBAREA RUNOFF (CFS) = 65.96
                                                                         BOX-FLOW(CFS) = 257.59
 EFFECTIVE AREA(ACRES) = 174.54 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 24.03
 AREA-AVERAGED Fp(INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.65
                                                                         LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20937.00 = 6676.03 FEET.
 TOTAL AREA(ACRES) = 174.5 PEAK FLOW RATE(CFS) =
                                                                        ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         FLOW PROCESS FROM NODE 20937.00 TO NODE 20937.00 IS CODE = 81
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                        ______
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
*************************
                                                                        ______
 FLOW PROCESS FROM NODE 20935.00 TO NODE 20936.00 IS CODE = 48
                                                                         MAINLINE Tc(MIN.) = 24.03
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.385
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fρ
                                                                                                                   αA
_____
                                                                             LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ELEVATION DATA: UPSTREAM(FEET) = 1485.00 DOWNSTREAM(FEET) = 1465.00
                                                                         RESIDENTIAL
                                                                         "3-4 DWELLINGS/ACRE" B 6.69
                                                                                                             0.75 0.600
                                                                                                                           56
 FLOW LENGTH (FEET) = 799.10 MANNING'S N = 0.014
                                                                                            в 28.27
                                                                                                            0.75 0.250
 GIVEN BOX BASEWIDTH (FEET) = 3.00 GIVEN BOX HEIGHT (FEET) = 6.00
                                                                         MOBILE HOME PARK
                                                                                                                           56
 FLOWDEPTH IN BOX IS 2.99 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.77
                                                                         COMMERCIAL
                                                                                                   1.13
                                                                                                             0.75
                                                                                                                    0.100
 BOX-FLOW(CFS) = 150.20
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 BOX-FLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 23.49
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.310
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20936.00 = 5963.49 FEET.
                                                                         SUBAREA AREA(ACRES) = 36.09
                                                                                                  SUBAREA RUNOFF(CFS) = 37.46
                                                                         EFFECTIVE AREA(ACRES) = 335.10 AREA-AVERAGED Fm(INCH/HR) = 0.42
AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.57
 FLOW PROCESS FROM NODE 20936.00 TO NODE 20936.00 IS CODE = 81
                                                                         TOTAL AREA (ACRES) = 335.1 PEAK FLOW RATE (CFS) = 289.99
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 MAINLINE Tc(MIN.) = 23.49
                                                                        * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.404
 SUBAREA LOSS RATE DATA (AMC II):
                                                                         FLOW PROCESS FROM NODE 20937.00 TO NODE 20938.00 IS CODE = 48
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                        Ap
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 25

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 26

```
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.320
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1415.00
                                                                           DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fρ
 FLOW LENGTH (FEET) = 983.49 MANNING'S N = 0.014
                                                                              LAND USE
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                           RESIDENTIAL
                                                                           "5-7 DWELLINGS/ACRE" B 6.87
 *GIVEN BOX HEIGHT (FEET) = 4.00 ESTIMATED BOX BASEWIDTH (FEET) = 4.48
                                                                                                               0.75
                                                                                                                      0.500
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 16.18
                                                                           RESIDENTIAL
                                                                                             в 0.91
                                                                                                               0.75
                                                                                                                      0.600
 BOX-FLOW(CFS) = 289.99
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                                B
                                                                                                       3.23
                                                                                                               0.75 0.600
 BOX-FLOW TRAVEL TIME (MIN.) = 1.01 Tc (MIN.) = 25.04
                                                                           SCHOOL
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20938.00 = 7659.52 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.538
*****************
                                                                                                       SUBAREA RUNOFF(CFS) = 9.10
                                                                           SUBAREA AREA(ACRES) = 11.01
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20938.00 IS CODE = 81
                                                                           EFFECTIVE AREA(ACRES) = 411.05 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
............
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                           TOTAL AREA (ACRES) =
                                                                                            411.1
                                                                                                        PEAK FLOW RATE(CFS) =
______
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 MAINLINE Tc(MIN.) = 25.04
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.351
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                     Fρ
                                                   SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         *******************
     LAND USE
 COMMERCIAL
                    В
                             3.30
                                     0.75
                                            0.100
                                                                           FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 1
 RESIDENTIAL
                                                                         ______
 "3-4 DWELLINGS/ACRE" B
                            20.77
                                     0.75
                                            0.600
                                                   56
                                                                          >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 RESIDENTIAL
                                                                          >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                      В 10.89
                                     0.75
                                            0.500
                                                  56
 "5-7 DWELLINGS/ACRE"
                                                                         ______
                             29.98
 MOBILE HOME PARK
                      В
                                     0.75
                                           0.250
                                                                           TOTAL NUMBER OF STREAMS = 2
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.396
                                                                           TIME OF CONCENTRATION (MIN.) = 26.04
                             SUBAREA RUNOFF(CFS) = 61.66
                                                                           RAINFALL INTENSITY (INCH/HR) = 1.32
 SUBAREA AREA(ACRES) = 64.94
 EFFECTIVE AREA(ACRES) = 400.04 AREA-AVERAGED Fm(INCH/HR) = 0.40
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.54
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.74
 TOTAL AREA (ACRES) =
                 400.0
                            PEAK FLOW RATE (CFS) = 341.42
                                                                           AREA-AVERAGED Ap = 0.54
                                                                           EFFECTIVE STREAM AREA(ACRES) = 411.05
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           TOTAL STREAM AREA(ACRES) = 411.05
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE = 341.42
** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 20938.00 TO NODE 20939.00 IS CODE = 48
                                                                           STREAM
                                                                                           Tc Intensity Fp(Fm)
                                                                                                                     Ae
______
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                      (ACRES) NODE
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                            1
                                                                                   296.55 28.74 1.244 0.75 (0.51) 0.69 449.2 20900.00
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                             1
                                                                                   229.42 38.87
                                                                                                1.038 0.74(0.52)0.70
                                                                                                                       495.5 20910.00
______
                                                                                   341.42 26.04
                                                                                                1.320 0.74(0.40) 0.54
                                                                                                                        411.1 20930.00
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1409.00
 FLOW LENGTH (FEET) = 668.85 MANNING'S N = 0.014
                                                                           RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                           CONFLUENCE FORMULA USED FOR 2 STREAMS.
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 7.67
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 11.12
                                                                           ** PEAK FLOW RATE TABLE **
 BOX-FLOW(CFS) =
                341.42
                                                                           STREAM
                                                                                     0
                                                                                           Tc Intensity Fp(Fm) Ap Ae HEADWATER
 BOX-FLOW TRAVEL TIME (MIN.) = 1.00 Tc (MIN.) = 26.04
                                                                           NUMBER
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                     (ACRES) NODE
 LONGEST FLOWPATH FROM NODE 20930.00 TO NODE 20939.00 = 8328.37 FEET.
                                                                            1
                                                                                   637.97 26.04 1.320 0.74(0.46) 0.62
                                                                                                                       818.1 20930.00
                                                                                   609.72 28.74 1.244 0.74 ( 0.46 ) 0.62
                                                                                                                        860.3 20900.00
******************
                                                                                   465.84 38.87 1.038 0.74(0.47) 0.63
                                                                                                                       906.5 20910.00
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 81
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           PEAK FLOW RATE (CFS) = 637.97 Tc (MIN.) = 26.04
_____
                                                                           EFFECTIVE AREA(ACRES) = 818.08 AREA-AVERAGED Fm(INCH/HR) = 0.46
 MAINLINE Tc(MIN.) = 26.04
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.62
```

Page 27

Date: 04/21/2014 File name: LR0209ZZ.RES

Date: 04/21/2014 File name: LR020977.RFS Page 28

SCS

56

341.42

HEADWATER

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TOTAL AREA (ACRES) =
                   906.5
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.556
                                                                           SUBAREA AREA(ACRES) = 94.33
UNIT-HYDROGRAPH DATA:
 FLOW PROCESS FROM NODE 20939.00 TO NODE 20939.00 IS CODE = 71
                                                                           RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.92;24H= 3.70
                                                                           S-GRAPH: VALLEY(DEV.) = 83.3%; VALLEY(UNDEV.) / DESERT = 16.7%
 >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
                                                                           Tc(HR) = 0.70; LAG(HR) = 0.56; Fm(INCH/HR) = 0.46; Ybar = 0.57
_____
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 UNIT-HYDROGRAPH DATA:
                                                                           DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.92;24H= 3.70
                                                                           3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 S-GRAPH: VALLEY (DEV.) = 81.6%; VALLEY (UNDEV.) / DESERT = 18.4%
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 1000.8
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                           LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
                                                                           EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Tc(HR) = 0.65; LAG(HR) = 0.52; Fm(INCH/HR) = 0.47; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                           Lca/L=0.3, n=.0432; Lca/L=0.4, n=.0387; Lca/L=0.5, n=.0356; Lca/L=0.6, n=.0332
                                                                           TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 144.10
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
                                                                           UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 610.52
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 906.5
                                                                           TOTAL AREA(ACRES) = 1000.8
                                                                                                                            637.97
                                                                                                        PEAK FLOW RATE(CFS) =
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20939.00 = 12474.01 FEET.
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0474; Lca/L=0.4,n=.0425; Lca/L=0.5,n=.0391;Lca/L=0.6,n=.0364
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 129.18
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 576.00
                                                                         *************************
 TOTAL PEAK FLOW RATE (CFS) = 576.00 (SOURCE FLOW INCLUDED)
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 637.97
                                                                           FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 10
  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 637.97)
 PEAK FLOW RATE (CFS) USED = 637.97
                                                                           >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
                                                                         ______
**********************
                                                                         FLOW PROCESS FROM NODE 20939.00 TO NODE 20940.00 IS CODE = 48
______
                                                                           FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 15.1
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                           >>>> DEFINE MEMORY BANK # 2 <<<<
______
                                                                         ______
 ELEVATION DATA: UPSTREAM(FEET) = 1409.00 DOWNSTREAM(FEET) = 1370.00
                                                                           PEAK FLOWRATE TABLE FILE NAME: 20852.DNA
 FLOW LENGTH (FEET) = 2606.42 MANNING'S N = 0.014
                                                                           MEMORY BANK # 2 DEFINED AS FOLLOWS:
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                           PEAK FLOW RATE (CFS) = 1554.74 Tc (MIN.) = 44.99
 *GIVEN BOX HEIGHT(FEET) = 4.00 ESTIMATED BOX BASEWIDTH(FEET) = 10.42
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.58
 ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.30
                                                                           TOTAL AREA (ACRES) = 2992.9
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
 BOX-FLOW(CFS) = 637.97
 BOX-FLOW TRAVEL TIME (MIN.) = 2.84 Tc (MIN.) = 41.71
                                                                         ******************
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
                                                                           FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 14.0
******************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 81
                                                                           >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
                                                                         ______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                           MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 MAINLINE Tc(MIN.) = 41.71
                                                                           PEAK FLOW RATE (CFS) = 1554.74 Tc (MIN.) = 44.99
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.995
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.58
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           TOTAL AREA (ACRES) = 2992.9
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                   Fρ
                                             αA
                                                   SCS
                                                                           LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20852.00 = 24422.29 FEET.
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         *****************
                             57.18
                                            0.600 56
                      В
                                     0.75
 SCHOOL
 RESIDENTIAL
                                                                           FLOW PROCESS FROM NODE 20852.00 TO NODE 20852.00 IS CODE = 12
                             27.41
                                             0.600
                                                   56
 "3-4 DWELLINGS/ACRE"
                      В
                                     0.75
 MOBILE HOME PARK
                      В
                             4.75
                                     0.75
                                             0.250
                                                   56
                                                                          >>>>CLEAR MEMORY BANK # 2 <<<<
 COMMERCIAL
                             4.99
                                     0.75
                                             0.100
```

Date: 04/21/2014

File name: LR020977.RFS

Page 29

Date: 04/21/2014 File name: LR0209ZZ.RES Page 30

```
*************************
 FLOW PROCESS FROM NODE 20852.00 TO NODE 20940.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <
 ELEVATION DATA: UPSTREAM(FEET) = 1413.00 DOWNSTREAM(FEET) = 1370.00
 FLOW LENGTH (FEET) = 2071.80 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 12.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 4.51 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 28.72
 BOX-FLOW(CFS) = 1554.74
 BOX-FLOW TRAVEL TIME (MIN.) = 1.20 Tc (MIN.) = 46.20
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
*************************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1554.74 Tc (MIN.) = 46.20
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.58
 TOTAL AREA (ACRES) = 2992.9
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 637.97 Tc (MIN.) = 41.71
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.57
 TOTAL AREA(ACRES) = 1000.8
 LONGEST FLOWPATH FROM NODE 20910.00 TO NODE 20940.00 = 15080.43 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.94;24H= 3.88
 S-GRAPH: VALLEY(DEV.) = 90.1%; VALLEY(UNDEV.) / DESERT = 9.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.77; LAG(HR) = 0.62; Fm(INCH/HR) = 0.48; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 3993.8
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20940.00 = 26494.09 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0313; Lca/L=0.4, n=.0281; Lca/L=0.5, n=.0258; Lca/L=0.6, n=.0241
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 572.31
 PEAK FLOW RATE (CFS) = 1927.36
*****************
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20940.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
_____
 FLOW PROCESS FROM NODE 20940.00 TO NODE 20955.00 IS CODE = 48
```

```
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1360.00
 FLOW LENGTH (FEET) = 618.86 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 16.00 GIVEN BOX HEIGHT (FEET) = 10.00
 FLOWDEPTH IN BOX IS 4.44 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 27.15
 BOX-FLOW(CFS) = 1927.36
 BOX-FLOW TRAVEL TIME (MIN.) = 0.38 Tc (MIN.) = 46.58
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 1927.36 Tc (MIN.) = 46.58
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.58
 TOTAL AREA(ACRES) = 3993.8
******************
 FLOW PROCESS FROM NODE 20950.00 TO NODE 20951.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 667.18
 ELEVATION DATA: UPSTREAM(FEET) = 1438.00 DOWNSTREAM(FEET) = 1417.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.046
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.490
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                 Fp
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                           αA
                                                 SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
    LAND USE
 MOBILE HOME PARK
                   B 4.45 0.75 0.250
                                                  56 9.05
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.19 0.75 0.600
                                                 56 11.09
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.324
 SUBAREA RUNOFF (CFS) = 11.41
 TOTAL AREA (ACRES) = 5.64 PEAK FLOW RATE (CFS) = 11.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
FLOW PROCESS FROM NODE 20951.00 TO NODE 20952.00 IS CODE = 92
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<
______
 UPSTREAM NODE ELEVATION (FEET) = 1417.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 191.07
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
```

Date: 04/21/2014 File name: LR0209ZZ.RES

Page 32

>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<

Date: 04/21/2014 File name: LR0209ZZ.RES Page 31

```
PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAXIMUM DEPTH(FEET) = 1.00
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.413
                                                                               END OF SUBAREA "V" GUTTER HYDRAULICS:
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                               DEPTH (FEET) = 0.57 FLOOD WIDTH (FEET) = 29.06
                                       Fρ
                                                Αp
                                                                               FLOW VELOCITY (FEET/SEC.) = 5.14 DEPTH*VELOCITY (FT*FT/SEC) = 2.94
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20953.00 = 1063.19 FEET.
 RESIDENTIAL
                    В
                               0.46
                                       0.75
                                               0.600
 "3-4 DWELLINGS/ACRE"
 MOBILE HOME PARK B
                                                                              *******************
                               2.56
                                               0.250 56
                                       0.75
                                                                               FLOW PROCESS FROM NODE 20953.00 TO NODE 20954.00 IS CODE = 92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.303
                                                                              ______
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 14.38
                                                                               >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 6.59
 AVERAGE FLOW DEPTH (FEET) = 0.49 FLOOD WIDTH (FEET) = 19.06
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1404.00
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.48 Tc (MIN.) = 9.53
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1400.00
 SUBAREA AREA(ACRES) = 3.02
                               SUBAREA RUNOFF(CFS) = 5.94
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 260.93
 EFFECTIVE AREA(ACRES) = 8.66 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                               "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
                                                                               PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 TOTAL AREA (ACRES) = 8.7 PEAK FLOW RATE (CFS) = 16.96
                                                                               PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                               MAXIMUM DEPTH(FEET) = 1.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.188
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                               SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA Fp
 END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                                   LAND USE
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 DEPTH (FEET) = 0.51 FLOOD WIDTH (FEET) = 21.45
                                                                               RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 6.55 DEPTH*VELOCITY (FT*FT/SEC) = 3.32
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                            3.52
                                                                                                                      0.75
                                                                                                                              0.600
                                                                                                    В
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20952.00 = 858.25 FEET.
                                                                                                  В
                                                                                                             0.19 0.75 0.250
                                                                               MOBILE HOME PARK
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
******************
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.582
 FLOW PROCESS FROM NODE 20952.00 TO NODE 20953.00 IS CODE = 92
                                                                               TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 24.66
______
                                                                               TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 4.28
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                               AVERAGE FLOW DEPTH(FEET) = 0.62 FLOOD WIDTH(FEET) = 34.74
                                                                               "V" GUTTER FLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 11.21
_____
 UPSTREAM NODE ELEVATION (FEET) = 1409.00
                                                                               SUBAREA AREA (ACRES) = 3.71 SUBAREA RUNOFF (CFS) = 5.85
 DOWNSTREAM NODE ELEVATION (FEET) = 1404.00
                                                                               EFFECTIVE AREA(ACRES) = 15.40 AREA-AVERAGED Fm(INCH/HR) = 0.30
 CHANNEL LENGTH THRU SUBAREA (FEET) = 204.94
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
                                                                               TOTAL AREA(ACRES) = 15.4
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                                                              PEAK FLOW RATE(CFS) =
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAXIMUM DEPTH(FEET) = 1.00
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.317
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                               ąΑ
                                                      SCS
                                                                               DEPTH(FEET) = 0.63 FLOOD WIDTH(FEET) = 35.78
                                                                               FLOW VELOCITY (FEET/SEC.) = 4.32 DEPTH*VELOCITY (FT*FT/SEC) = 2.71
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20954.00 = 1324.12 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                                                      56
                                       0.75
                                               0.600
                             1.20
                                                                              ******************
 MOBILE HOME PARK
                     В
                              1.83
                                       0.75
                                               0.250 56
                                                                               FLOW PROCESS FROM NODE 20954.00 TO NODE 20955.00 IS CODE = 42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.389
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 19.72
                                                                               >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 5.10
                                                                               >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 AVERAGE FLOW DEPTH(FEET) = 0.56 FLOOD WIDTH(FEET) = 27.57
                                                                              ______
 "V" GUTTER FLOW TRAVEL TIME (MIN.) = 0.67 Tc (MIN.) = 10.20
                                                                               UPSTREAM NODE ELEVATION (FEET) = 1400.00
 SUBAREA AREA(ACRES) = 3.03
                               SUBAREA RUNOFF (CFS) = 5.52
                                                                               DOWNSTREAM NODE ELEVATION (FEET) = 1360.00
 EFFECTIVE AREA(ACRES) = 11.69 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                               FLOW LENGTH (FEET) = 1961.31 MANNING'S N = 0.013
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 TOTAL AREA (ACRES) = 11.7 PEAK FLOW RATE (CFS) =
                                                                               USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
                                                                               DEPTH OF FLOW IN 84.0 INCH PIPE IS 9.8 INCHES
```

Date: 04/21/2014

Date: 04/21/2014 File name: LR0209ZZ.RES File name: LR020977.RFS Page 33 Page 34

SCS

56

26.24

```
PIPE-FLOW VELOCITY(FEET/SEC.) = 10.47
 PIPE-FLOW(CFS) =
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 3.12 Tc (MIN.) = 14.34
 LONGEST FLOWPATH FROM NODE 20950.00 TO NODE 20955.00 = 3285.43 FEET.
*******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 81
_____
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 14.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.888
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                            Ар
                                                  SCS
                                  Fρ
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                    В
                            0.07 0.75
                                          0.850 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                            7.87
                                    0.75
                                            0.600
                                                  56
 MOBILE HOME PARK
                    В
                             1.54
                                     0.75
                                            0.250 56
 COMMERCIAL
                      В
                             9.50
                                     0.75
                                           0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.322
 SUBAREA AREA(ACRES) = 18.98
                            SUBAREA RUNOFF (CFS) = 28.14
 EFFECTIVE AREA(ACRES) = 34.38 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.35
 TOTAL AREA (ACRES) =
                  34.4 PEAK FLOW RATE (CFS) =
                                                   50.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 14.34
 RAINFALL INTENSITY (INCH/HR) = 1.89
 AREA-AVERAGED Fm (INCH/HR) = 0.27
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.35
 EFFECTIVE STREAM AREA(ACRES) = 34.38
 TOTAL STREAM AREA(ACRES) = 34.38
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                               50.22
 ** CONFLUENCE DATA **
 STREAM
        0
               Tc AREA
                               HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
   1
        1927.36 46.58 3993.76 20620.00
         50.22 14.34 34.38 20950.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.94;24H= 3.88
 S-GRAPH: VALLEY(DEV.) = 90.2%; VALLEY(UNDEV.) / DESERT = 9.8%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
```

```
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.82; 30M = 0.82; 1HR = 0.82;
 3HR = 0.97; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 4028.1
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0310; Lca/L=0.4, n=.0278; Lca/L=0.5, n=.0255; Lca/L=0.6, n=.0238
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 579.23
 PEAK FLOW RATE (CFS) = 1935.20
******************
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
PEAK FLOWRATE TABLE FILE NAME: 20539.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2190.53 Tc (MIN.) = 54.19
 AREA-AVERAGED Fm (INCH/HR) = 0.55 Ybar = 0.62
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 2190.53 Tc (MIN.) = 54.19
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.62
 TOTAL AREA (ACRES) = 5998.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20539.00 = 35104.25 FEET.
*****************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20539.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
_____
*****************
 FLOW PROCESS FROM NODE 20539.00 TO NODE 20955.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1366.00 DOWNSTREAM(FEET) = 1360.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 385.80 CHANNEL SLOPE = 0.0156
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 2190.53
```

Page 36

Tc(HR) = 0.78; LAG(HR) = 0.62; Fm(INCH/HR) = 0.48; Ybar = 0.58

Date: 04/21/2014 File name: LR0209ZZ.RES Page 35 Date: 04/21/2014 File name: LR0209ZZ.RES

```
FLOW VELOCITY (FEET/SEC.) = 24.74 FLOW DEPTH (FEET) = 4.30
                                                                          ******************
 TRAVEL TIME (MIN.) = 0.26 Tc (MIN.) = 54.45
                                                                           FLOW PROCESS FROM NODE 20956.00 TO NODE 20956.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
                                                                          ______
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
************************
                                                                          ______
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 11
                                                                           MAINLINE Tc (MIN.) = 54.83
                                                                            * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.844
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                           SUBAREA LOSS RATE DATA (AMC II):
_____
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
                                                                                                                              SCS
                                                                               LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 ** MAIN STREAM CONFLUENCE DATA **
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE"
 PEAK FLOW RATE (CFS) = 2190.53
                                                                                               B
                             Tc(MIN.) = 54.45
                                                                                                       5.80
                                                                                                             0.75 0.600
                                                                                                                              56
 AREA-AVERAGED Fm(INCH/HR) = 0.55 Ybar = 0.62
                                                                           COMMERCIAL
                                                                                               В
                                                                                                      17.13
                                                                                                              0.75
                                                                                                                       0.100
                                                                                                                              56
 TOTAL AREA (ACRES) = 5998.3
                                                                           PUBLIC PARK
                                                                                                В
                                                                                                      0.39
                                                                                                                0.75
                                                                                                                       0.850
                                                                                                                               56
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.237
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                           SUBAREA AREA(ACRES) = 23.32
 PEAK FLOW RATE (CFS) = 1935.20 Tc (MIN.) = 46.58
                                                                           UNIT-HYDROGRAPH DATA:
 AREA-AVERAGED Fm(INCH/HR) = 0.48 Ybar = 0.58
                                                                           RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.05;24H= 4.21
 TOTAL AREA(ACRES) = 4028.1
                                                                           S-GRAPH: VALLEY(DEV.) = 69.0%; VALLEY(UNDEV.)/DESERT= 31.0%
 LONGEST FLOWPATH FROM NODE 20620.00 TO NODE 20955.00 = 27112.95 FEET.
                                                                                  MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                           Tc(HR) = 0.91; LAG(HR) = 0.73; Fm(INCH/HR) = 0.52; Ybar = 0.60
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 UNIT-HYDROGRAPH DATA:
                                                                           DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.05;24H= 4.21
                                                                           3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10049.7
 S-GRAPH: VALLEY (DEV.) = 68.9%; VALLEY (UNDEV.) / DESERT = 31.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                           LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
 Tc(HR) = 0.91; LAG(HR) = 0.73; Fm(INCH/HR) = 0.52; Ybar = 0.61
                                                                            EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                            Lca/L=0.3,n=.0321; Lca/L=0.4,n=.0288; Lca/L=0.5,n=.0265; Lca/L=0.6,n=.0247
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
                                                                           TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 1432.94
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                           UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3339.72
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10026.4
                                                                           TOTAL AREA(ACRES) = 10049.7
                                                                                                         PEAK FLOW RATE (CFS) = 3350.10
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20955.00 = 35490.05 FEET.
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0325; Lca/L=0.4,n=.0291; Lca/L=0.5,n=.0267; Lca/L=0.6,n=.0249
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 1427.50
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 PEAK FLOW RATE (CFS) = 3350.10
                                                                          *******************
                                                                            FLOW PROCESS FROM NODE 20956.00 TO NODE 20968.00 IS CODE = 48
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20955.00 IS CODE = 12
                                                                          ______
                                                                           >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>CLEAR MEMORY BANK # 1 <<<<
                                                                           >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
                                                                          ______
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1335.00
******************
                                                                           FLOW LENGTH (FEET) = 926.11 MANNING'S N = 0.014
 FLOW PROCESS FROM NODE 20955.00 TO NODE 20956.00 IS CODE = 48
                                                                           GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
                                                                           FLOWDEPTH IN BOX IS 4.79 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 30.43
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA
                                                                           BOX-FLOW(CFS) = 3350.10
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
                                                                           BOX-FLOW TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 55.33
______
                                                                           LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
 ELEVATION DATA: UPSTREAM(FEET) = 1360.00 DOWNSTREAM(FEET) = 1350.00
                                                                          FLOW LENGTH (FEET) = 666.58 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 23.00 GIVEN BOX HEIGHT (FEET) = 10.00
                                                                           FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 81
 FLOWDEPTH IN BOX IS 4.92 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 29.63
 BOX-FLOW(CFS) = 3350.10
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
 BOX-FLOW TRAVEL TIME (MIN.) = 0.37 Tc (MIN.) = 54.83
                                                                          _______
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20956.00 = 36156.63 FEET.
                                                                           MAINLINE Tc(MIN.) = 55.33
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.840
```

Date: 04/21/2014

File name: LR020977.RFS

Page 38

Page 37

Date: 04/21/2014

File name: LR0209ZZ.RES

```
SUBAREA LOSS RATE DATA (AMC II):
                                                                                RESIDENTIAL
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 "3-4 DWELLINGS/ACRE" B 0.91 0.75 0.600 56 13.72
                                       Fρ
                                                 Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL.
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.296
 "3-4 DWELLINGS/ACRE" B
                             2.51
                                        0.75
                                                0.600
                                                                                SUBAREA RUNOFF(CFS) = 16.66
 COMMERCIAL B 3.07 0.75
                                                0.100 56
                                                                                TOTAL AREA (ACRES) = 8.79 PEAK FLOW RATE (CFS) = 16.66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA(ACRES) = 5.58
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 UNIT-HYDROGRAPH DATA:
                                                                               ******************
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.05;24H= 4.21
 S-GRAPH: VALLEY(DEV.) = 69.0%; VALLEY(UNDEV.) / DESERT = 31.0%
                                                                                FLOW PROCESS FROM NODE 20961.00 TO NODE 20962.00 IS CODE = 63
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.52; Ybar = 0.60
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;
                                                                               ______
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                                UPSTREAM ELEVATION(FEET) = 1360.00 DOWNSTREAM ELEVATION(FEET) = 1359.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10055.3
                                                                                STREET LENGTH (FEET) = 280.72 CURB HEIGHT (INCHES) = 6.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
                                                                                STREET HALFWIDTH (FEET) = 18.00
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0317; Lca/L=0.4,n=.0284; Lca/L=0.5,n=.0261; Lca/L=0.6,n=.0244
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 1434.11
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3313.62
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 TOTAL AREA (ACRES) = 10055.3 PEAK FLOW RATE (CFS) = 3350.10
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
******************
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
                                                                                                                                  20.20
                                                                                  ***STREET FLOWING FULL***
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
_____
                                                                                  STREET FLOW DEPTH (FEET) = 0.57
 TOTAL NUMBER OF STREAMS = 2
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 21.67
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.99
 PEAK FLOW RATE (CFS) = 3350.10 Tc (MIN.) = 55.33
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.14
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.60
                                                                                 STREET FLOW TRAVEL TIME (MIN.) = 2.35 Tc (MIN.) = 12.47
 TOTAL AREA(ACRES) = 10055.3
                                                                                 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.054
                                                                                SUBAREA LOSS RATE DATA (AMC II):
******************
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fp
                                                                                                                                Aр
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 20960.00 TO NODE 20961.00 IS CODE = 21
                                                                                    LAND USE
                                                                                RESIDENTIAL
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                "5-7 DWELLINGS/ACRE"
                                                                                                    в 1.51
                                                                                                                        0.75
                                                                                                                               0.500
                                                                                                       в 2.33
                                                                                                                       0.75
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                COMMERCIAL
                                                                                                                               0.100
______
                                                                                RESIDENTIAL
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 935.10
                                                                                "3-4 DWELLINGS/ACRE" B 0.44
                                                                                                                        0.75
 ELEVATION DATA: UPSTREAM(FEET) = 1380.00 DOWNSTREAM(FEET) = 1360.00
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.293
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                                 SUBAREA AREA(ACRES) = 4.28 SUBAREA RUNOFF(CFS) = 7.07
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.120
                                                                                EFFECTIVE AREA(ACRES) = 13.07 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.327
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                                 TOTAL AREA (ACRES) = 13.1 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                Ap SCS Tc
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                             3.18
                                        0.75
                                                0.500
                                                      56 12.95
 COMMERCIAL
                        В
                                4.70
                                        0.75
                                                0.100 56 10.12
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
```

Page 39

Date: 04/21/2014 File name: LR0209ZZ.RES

Date: 04/21/2014 File name: LR0209ZZ.RES Page 40

56

21.56

```
DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.22
 FLOW VELOCITY (FEET/SEC.) = 2.03 DEPTH*VELOCITY (FT*FT/SEC.) = 1.19
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20962.00 = 1215.82 FEET.
*****************
 FLOW PROCESS FROM NODE 20962.00 TO NODE 20963.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1359.00 DOWNSTREAM ELEVATION(FEET) = 1358.50
 STREET LENGTH (FEET) = 189.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 24.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.20
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 14.12
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.906
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     B 1.24
                                         0.75
                                                 0.500 56
                      в 1.91
 COMMERCIAL
                                         0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.309
 SUBAREA AREA (ACRES) = 3.71 SUBAREA RUNOFF (CFS) = 5.59
 EFFECTIVE AREA(ACRES) = 16.78 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 16.8 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.97
 FLOW VELOCITY (FEET/SEC.) = 1.92 DEPTH*VELOCITY (FT*FT/SEC.) = 1.23
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20963.00 = 1404.92 FEET.
FLOW PROCESS FROM NODE 20963.00 TO NODE 20964.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1358.50 DOWNSTREAM ELEVATION(FEET) = 1358.00
 STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.66
   HALFSTREET FLOOD WIDTH (FEET) = 26.19
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 STREET FLOW TRAVEL TIME (MIN.) = 1.74 Tc (MIN.) = 15.86
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.778
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 1.22 COMMERCIAL B 1.94
                                        0.75
                                                0.500
                                                       56
                                        0.75
                                                0.100
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.298
 SUBAREA AREA(ACRES) = 3.61 SUBAREA RUNOFF(CFS) = 5.05
 EFFECTIVE AREA(ACRES) = 20.39 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.30
 TOTAL AREA(ACRES) = 20.4 PEAK FLOW RATE(CFS) = 28.53
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.43
 FLOW VELOCITY (FEET/SEC.) = 1.94 DEPTH*VELOCITY (FT*FT/SEC.) = 1.30
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20964.00 = 1606.51 FEET.
*****************
 FLOW PROCESS FROM NODE 20964.00 TO NODE 20965.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1358.00 DOWNSTREAM ELEVATION(FEET) = 1357.50
 STREET LENGTH (FEET) = 201.59 CURB HEIGHT (INCHES) = 6.0
```

Date: 04/21/2014 File name: LR0209ZZ.RES Page 41

File name: LR0209ZZ.RES

Page 42

Date: 04/21/2014

\_\_\_\_\_

UPSTREAM ELEVATION(FEET) = 1357.50 DOWNSTREAM ELEVATION(FEET) = 1357.00 STREET LENGTH (FEET) = 207.50 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020

\*\*TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.24 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.71HALFSTREET FLOOD WIDTH (FEET) = 28.51 AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.02 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.43 STREET FLOW TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 19.27 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.581 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE RESIDENTIAL "5-7 DWELLINGS/ACRE" A 0.74 0.98 0.500 COMMERCIAL В 0.93 0.75 0.100 56 2.70 COMMERCIAL В 0.75 0.100 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.168 SUBAREA AREA(ACRES) = 4.37 SUBAREA RUNOFF(CFS) = 5.65 EFFECTIVE AREA(ACRES) = 28.59 AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp(INCH/HR) = 0.76 AREA-AVERAGED Ap = 0.29 TOTAL AREA(ACRES) = 28.6 PEAK FLOW RATE(CFS) = SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70 END OF SUBAREA STREET FLOW HYDRAULICS: DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 28.82 FLOW VELOCITY (FEET/SEC.) = 2.02 DEPTH\*VELOCITY (FT\*FT/SEC.) = 1.45 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20966.00 = 2015.60 FEET. \* FLOW PROCESS FROM NODE 20966.00 TO NODE 20967.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1357.00 DOWNSTREAM ELEVATION(FEET) = 1356.00 STREET LENGTH (FEET) = 341.55 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00 INSIDE STREET CROSSFALL (DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90

File name: LR0209ZZ.RES

Date: 04/21/2014

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

32

35.09

Page 44

Date: 04/21/2014 Page 43 File name: LR020977.RFS

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                  "3-4 DWELLINGS/ACRE" B 3.04 0.75 0.600
   ***STREET FLOWING FULL***
                                                                                 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.192
   STREET FLOW DEPTH (FEET) = 0.72
                                                                                  SUBAREA AREA (ACRES) = 16.61 SUBAREA RUNOFF (CFS) = 18.22
   HALFSTREET FLOOD WIDTH (FEET) = 28.82
                                                                                 EFFECTIVE AREA(ACRES) = 51.61 AREA-AVERAGED Fm(INCH/HR) = 0.19
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.77 AREA-AVERAGED Ap = 0.25
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.23
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
                                                                                  TOTAL AREA (ACRES) = 51.6
                                                                                                                 PEAK FLOW RATE(CFS) =
                                                                                                                                          54.24
 STREET FLOW TRAVEL TIME (MIN.) = 2.55 Tc (MIN.) = 21.82
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.468
                                                                                 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 STREET CROSS-SECTION INFORMATION:
 RESIDENTIAL
                                                                                 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 26.00
 "5-7 DWELLINGS/ACRE" A
                                2.02
                                         0.98
                                                 0.500
                                                                                 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 RESIDENTIAL
                                                      56
 "5-7 DWELLINGS/ACRE"
                     В
                                0.32
                                         0.75
                                                 0.500
                                                                                 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                0.04
                                         0.98
                                                 0.100
                                                                                 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 COMMERCIAL
                        A
 COMMERCIAL
                       В
                                4.03
                                         0.75
                                                 0.100 56
                                                                                 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.89
                                                                                 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
                                                                                 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 SUBAREA AREA (ACRES) = 6.41 SUBAREA RUNOFF (CFS) = 7.20
                                                                                 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 EFFECTIVE AREA(ACRES) = 35.00 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                 STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 AREA-AVERAGED Fp(INCH/HR) = 0.78 AREA-AVERAGED Ap = 0.28
                                                                                 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 14.88
 TOTAL AREA(ACRES) = 35.0 PEAK FLOW RATE(CFS) =
                                                                                   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   STREET FLOW DEPTH (FEET) = 0.48
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   HALFSTREET FLOOD WIDTH (FEET) = 15.89
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70
                                                                                   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.74
                                                                                   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.30
                                                                                  LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20968.00 = 4087.30 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72 HALFSTREET FLOOD WIDTH(FEET) = 29.00
                                                                                *******************
 FLOW VELOCITY (FEET/SEC.) = 2.24 DEPTH*VELOCITY (FT*FT/SEC.) = 1.61
                                                                                  FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 1
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS.
       AND L = 341.5 FT WITH ELEVATION-DROP = 1.0 FT, IS 12.2 CFS,
                                                                                ______
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 20967.00
                                                                                 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 LONGEST FLOWPATH FROM NODE 20960.00 TO NODE 20967.00 = 2357.15 FEET.
                                                                                 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                                ______
TOTAL NUMBER OF STREAMS = 2
                                                                                 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 20967.00 TO NODE 20968.00 IS CODE = 33
______
                                                                                 TIME OF CONCENTRATION (MIN.) = 24.73
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                 RAINFALL INTENSITY (INCH/HR) = 1.36
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.19
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.77
______
 UPSTREAM NODE ELEVATION (FEET) = 1356.00
                                                                                 AREA-AVERAGED Ap = 0.25
 DOWNSTREAM NODE ELEVATION (FEET) = 1335.00
                                                                                 EFFECTIVE STREAM AREA(ACRES) = 51.61
                                                                                 TOTAL STREAM AREA(ACRES) = 51.61
 FLOW LENGTH (FEET) = 1730.15 MANNING'S N = 0.013
                                                                                 PEAK FLOW RATE (CFS) AT CONFLUENCE = 54.24
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
                                                                                 ** CONFLUENCE DATA **
                                                                                                                   HEADWATER
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 17.3 INCHES
                                                                                 STREAM
                                                                                          0
                                                                                                  Tc
                                                                                                          AREA
 PIPE-FLOW VELOCITY(FEET/SEC.) = 10.54
                                                                                 NUMBER (CFS) (MIN.) (ACRES)
 PIPE-FLOW(CFS) =
                    39.36
                                                                                  1
                                                                                          3350.10 55.33 10055.32 20120.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                          54.24 24.73 51.61 20960.00
 PIPEFLOW TRAVEL TIME (MIN.) = 2.90 Tc (MIN.) = 24.73
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.362
                                                                                 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  UNIT-HYDROGRAPH DATA:
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.05;24H= 4.21
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 S-GRAPH: VALLEY (DEV.) = 69.2%; VALLEY (UNDEV.) / DESERT= 30.8%
 COMMERCIAL
                      В
                               13.57
                                                 0.100 56
                                                                                         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
```

RESIDENTIAL

Date: 04/21/2014 File name: LR0209ZZ.RES Page 45 Date: 04/21/2014 File name: LR0209ZZ.RES

Page 46

Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.52; Ybar = 0.60 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68; 3HR = 0.94; 6HR = 0.97; 24HR = 0.98UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10106.9 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0317; Lca/L=0.4, n=.0284; Lca/L=0.5, n=.0261; Lca/L=0.6, n=.0244 TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 1445.87 PEAK FLOW RATE(CFS) = 3334.99 (UPSTREAM NODE PEAK FLOW RATE (CFS) = 3350.10) PEAK FLOW RATE (CFS) USED = 3350.10 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 152 \_\_\_\_\_\_ >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 20968.DNA \_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 10106.9 TC (MIN.) = 55.33 AREA-AVERAGED Fm (INCH/HR) = 0.52 Ybar = 0.60PEAK FLOW RATE (CFS) = 3350.10\_\_\_\_\_\_ \_\_\_\_\_\_

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0209ZZ.RES Page 47 Date: 04/21/2014 File name: LR0209ZZ.RES Page 48

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21070

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0210ZZ.DAT

TIME/DATE OF STUDY: 08:01 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*
HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

	HILDE	CROWN IO	THE CHOOSE AND IN	COND	COTTEN			FRANKING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS: AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21000.00 TO NODE 21001.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 690.87 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1518.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.815 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.121 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ αA GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL 5.92 0.75 0.600 "3-4 DWELLINGS/ACRE" B 56 11.82 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600 SUBAREA RUNOFF (CFS) = 8.91 TOTAL AREA (ACRES) = 5.92 PEAK FLOW RATE (CFS) = 8.91 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21001.00 TO NODE 21002.00 IS CODE = 63 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <<<< \_\_\_\_\_ UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1480.00 STREET LENGTH (FEET) = 646.60 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

Date: 04/21/2014 File name: LR0210ZZ.RES Page 1 Date: 04/21/2014 File name: LR0210ZZ.RES Page 2

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.36
   HALFSTREET FLOOD WIDTH (FEET) = 11.79
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.80
 STREET FLOW TRAVEL TIME (MIN.) = 2.17 Tc (MIN.) = 13.98
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.917
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            9.22
                                       0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.22
                             SUBAREA RUNOFF (CFS) = 12.18
 EFFECTIVE AREA(ACRES) = 15.14 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.1 PEAK FLOW RATE (CFS) =
                                                      20.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.27
 FLOW VELOCITY(FEET/SEC.) = 5.32 DEPTH*VELOCITY(FT*FT/SEC.) = 2.08
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21002.00 = 1337.47 FEET.
FLOW PROCESS FROM NODE 21002.00 TO NODE 21013.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1433.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1375.46 CHANNEL SLOPE = 0.0342
 CHANNEL BASE (FEET) = 3.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 1.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 20.01
 FLOW VELOCITY (FEET/SEC.) = 5.38 FLOW DEPTH (FEET) = 0.81
 TRAVEL TIME (MIN.) = 4.26 Tc (MIN.) = 18.24
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.
*****************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc (MIN.) = 18.24
```

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.634
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
   LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.03 0.75 0.600
                                                   56
                           7.98 0.75 0.600 56
 SCHOOT.
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 15.01 SUBAREA RUNOFF (CFS) = 16.02
 EFFECTIVE AREA(ACRES) = 30.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 30.2
                              PEAK FLOW RATE(CFS) =
                                                   32.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
************************
 FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 18.24
 RAINFALL INTENSITY (INCH/HR) = 1.63
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.60
 EFFECTIVE STREAM AREA(ACRES) = 30.15
 TOTAL STREAM AREA(ACRES) = 30.15
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                 32.17
*******************
 FLOW PROCESS FROM NODE 21010.00 TO NODE 21011.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.60
 ELEVATION DATA: UPSTREAM(FEET) = 1490.00 DOWNSTREAM(FEET) = 1462.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.628
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.038
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Ар
                                                  SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    B 7.05 0.75 0.600
                                                 56 12.63
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 10.08
 TOTAL AREA (ACRES) = 7.05 PEAK FLOW RATE (CFS) = 10.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 3 Date: 04/21/2014 File name: LR0210ZZ.RES Page 4

```
******************
 FLOW PROCESS FROM NODE 21011.00 TO NODE 21012.00 IS CODE = 63
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
______
                                                                               INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1462.00 DOWNSTREAM ELEVATION(FEET) = 1440.00
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 809.73 CURB HEIGHT (INCHES) = 6.0
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                STREET FLOW DEPTH (FEET) = 0.42
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 14.76
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.49
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.47
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              STREET FLOW TRAVEL TIME (MIN.) = 1.49 Tc (MIN.) = 17.86
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
                                                                               * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.655
                                                                               SUBAREA LOSS RATE DATA (AMC II):
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.28
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                                   SCS
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                  LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.39
                                                                              RESIDENTIAL
                                                                               "3-4 DWELLINGS/ACRE" B 0.66 0.75 0.600 56
   HALFSTREET FLOOD WIDTH (FEET) = 13.12
                                                                                                   B 1.95 0.75 0.600 56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.40
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 3.74 Tc (MIN.) = 16.37
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.744
                                                                               SUBAREA AREA (ACRES) = 2.61 SUBAREA RUNOFF (CFS) = 2.83
                                                                               EFFECTIVE AREA(ACRES) = 15.13 AREA-AVERAGED Fm(INCH/HR) = 0.45
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP SCS
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                               TOTAL AREA(ACRES) = 15.1 PEAK FLOW RATE(CFS) = 16.43
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             4.37
                                       0.75 0.600 56
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SCHOOL
                      В
                             1.10 0.75 0.600 56
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 5.47 SUBAREA RUNOFF (CFS) = 6.38
                                                                               DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.91
 EFFECTIVE AREA(ACRES) = 12.52 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                               FLOW VELOCITY (FEET/SEC.) = 3.51 DEPTH*VELOCITY (FT*FT/SEC.) = 1.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                               LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21013.00 = 2033.40 FEET.
 TOTAL AREA(ACRES) = 12.5 PEAK FLOW RATE(CFS) =
                                                       14.60
                                                                             ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               FLOW PROCESS FROM NODE 21013.00 TO NODE 21013.00 IS CODE = 1
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                              >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.66
                                                                             ______
 FLOW VELOCITY (FEET/SEC.) = 3.68 DEPTH*VELOCITY (FT*FT/SEC.) = 1.47
                                                                               TOTAL NUMBER OF STREAMS = 2
 LONGEST FLOWPATH FROM NODE 21010.00 TO NODE 21012.00 = 1721.33 FEET.
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                               TIME OF CONCENTRATION (MIN.) = 17.86
******************
                                                                               RAINFALL INTENSITY (INCH/HR) = 1.66
 FLOW PROCESS FROM NODE 21012.00 TO NODE 21013.00 IS CODE = 63
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.45
______
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               AREA-AVERAGED Ap = 0.60
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                               EFFECTIVE STREAM AREA(ACRES) = 15.13
______
                                                                               TOTAL STREAM AREA(ACRES) = 15.13
 UPSTREAM ELEVATION(FEET) = 1440.00 DOWNSTREAM ELEVATION(FEET) = 1433.00
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE = 16.43
 STREET LENGTH (FEET) = 312.07 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                               ** CONFLUENCE DATA **
```

Date: 04/21/2014

File name: LR0210ZZ.RES

Page 6

STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 32.17 18.24 1.634 0.75(0.45) 0.60 30.2 21000.00 2 16.43 17.86 1.655 0.75(0.45) 0.60 15.1 21010.00	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44  **********************************
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.	>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 5 USED) <>>>>
** PEAK FLOW RATE TABLE **  STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER  NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	UPSTREAM ELEVATION(FEET) = 1380.00 DOWNSTREAM ELEVATION(FEET) = 1345.00 STREET LENGTH(FEET) = 1339.49 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00
1 48.48 17.86 1.655 0.75(0.45) 0.60 44.6 21010.00 2 48.32 18.24 1.634 0.75(0.45) 0.60 45.3 21000.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:	DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
PEAK FLOW RATE (CFS) = 48.48 Tc (MIN.) = 17.86  EFFECTIVE AREA (ACRES) = 44.65 AREA-AVERAGED Fm (INCH/HR) = 0.45  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60  TOTAL AREA (ACRES) = 45.3  LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21013.00 = 2712.93 FEET.	SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.84
FLOW PROCESS FROM NODE 21013.00 TO NODE 21014.00 IS CODE = 54	**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 68.98 ***STREET FLOWING FULL***
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<>>> >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>	STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.63
ELEVATION DATA: UPSTREAM(FEET) = 1433.00 DOWNSTREAM(FEET) = 1380.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 1311.64 CHANNEL SLOPE = 0.0404 CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 5.000 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH(FEET) = 2.50 CHANNEL FLOW THRU SUBAREA(CFS) = 48.48 FLOW VELOCITY(FEET/SEC.) = 5.99 FLOW DEPTH(FEET) = 0.87 TRAVEL TIME(MIN.) = 3.65 Tc(MIN.) = 21.51	AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.80  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.55  STREET FLOW TRAVEL TIME (MIN.) = 3.85 Tc (MIN.) = 25.36  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.341  SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21014.00 = 4024.57 FEET.	RESIDENTIAL "3-4 DWELLINGS/ACRE" B 4.31 0.75 0.600 56 MOBILE HOME PARK B 9.23 0.75 0.250 56
FLOW PROCESS FROM NODE 21014.00 TO NODE 21014.00 IS CODE = 81	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.361
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<	SUBAREA AREA(ACRES) = 13.54 SUBAREA RUNOFF(CFS) = 13.05 EFFECTIVE AREA(ACRES) = 79.98 AREA-AVERAGED Fm(INCH/HR) = 0.41 AREA-AVERAGED FD(INCH/HR) = 0.75 AREA-AVERAGED AD = 0.55
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.481 SUBAREA LOSS RATE DATA(AMC II):	TOTAL AREA (ACRES) = 80.6 PEAK FLOW RATE (CFS) = 67.17
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
"3-4 DWELLINGS/ACRE" B 19.47 0.75 0.600 56  COMMERCIAL B 2.09 0.75 0.100 56  MOBILE HOME PARK B 0.23 0.75 0.250 56  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.548	END OF SUBAREA STREET FLOW HYDRAULICS:  DEPTH(FEET) = 0.61
SUBAREA AREA (ACRES) = 21.79 SUBAREA RUNOFF (CFS) = 20.99  EFFECTIVE AREA (ACRES) = 66.44 AREA-AVERAGED Fm (INCH/HR) = 0.44  AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58  TOTAL AREA (ACRES) = 67.1 PEAK FLOW RATE (CFS) = 62.46	**************************************
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	>>>> (STREET TABLE SECTION # 5 USED) <<<<

Date: 04/21/2014 File name: LR0210ZZ.RES Page 7 Date: 04/21/2014 File name: LR0210ZZ.RES Page 8

```
UPSTREAM ELEVATION(FEET) = 1345.00 DOWNSTREAM ELEVATION(FEET) = 1332.00
 STREET LENGTH (FEET) = 945.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 26.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.64
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 3.16
 STREET FLOW TRAVEL TIME (MIN.) = 3.39 Tc (MIN.) = 28.75
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.244
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
      LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                                 1.76
                                          0.75
                                                   0.600
                                                         56
                                 3.85
                                          0.75
                                                   0.600
                                                         56
 SCHOOL
                         В
 MOBILE HOME PARK
                         В
                                 2.60
                                          0.75
                                                   0.250
 PUBLIC PARK
                                 0.44
                                          0.75
                                                  0.850
 COMMERCIAL
                         В
                                 0.91
                                          0.75
                                                   0.100
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.469
 SUBAREA AREA(ACRES) = 9.56
                                 SUBAREA RUNOFF (CFS) = 7.69
 EFFECTIVE AREA(ACRES) = 89.54 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
 TOTAL AREA(ACRES) = 90.2 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.67 HALFSTREET FLOOD WIDTH(FEET) = 26.50
 FLOW VELOCITY (FEET/SEC.) = 4.59 DEPTH*VELOCITY (FT*FT/SEC.) = 3.08
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
******************
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 28.75
 RAINFALL INTENSITY (INCH/HR) = 1.24
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75
```

```
EFFECTIVE STREAM AREA(ACRES) = 89.54
 TOTAL STREAM AREA(ACRES) =
                        90.17
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                  67.85
FLOW PROCESS FROM NODE 21020.00 TO NODE 21021.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 732.03
 ELEVATION DATA: UPSTREAM(FEET) = 1442.00 DOWNSTREAM(FEET) = 1440.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 15.306
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.816
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                       В
                          1.89
                                      0.75
                                             0.600
                                                     56 18.77
 MOBILE HOME PARK
                      В
                             4.31
                                   0.75
                                             0.250
                                                    56 15.31
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.357
 SUBAREA RUNOFF(CFS) =
                       8.64
 TOTAL AREA (ACRES) = 6.20 PEAK FLOW RATE (CFS) =
                                                8.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21021.00 TO NODE 21022.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1440.00 DOWNSTREAM ELEVATION(FEET) = 1433.00
 STREET LENGTH (FEET) = 186.35 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                              12.09
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.36
  HALFSTREET FLOOD WIDTH (FEET) = 11.87
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.96
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.44
 STREET FLOW TRAVEL TIME (MIN.) = 0.78 Tc (MIN.) = 16.09
```

File name: LR0210ZZ.RES

Page 10

AREA-AVERAGED Ap = 0.54

Date: 04/21/2014

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.762
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                   B 4.18 0.75 0.250 56
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.81 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.307
 SUBAREA AREA (ACRES) = 4.99 SUBAREA RUNOFF (CFS) = 6.88
 EFFECTIVE AREA(ACRES) = 11.19 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.33
 TOTAL AREA (ACRES) = 11.2 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.34: 6HR = 1.85: 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.04
 FLOW VELOCITY (FEET/SEC.) = 4.19 DEPTH*VELOCITY (FT*FT/SEC.) = 1.62
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21022.00 = 918.38 FEET.
FLOW PROCESS FROM NODE 21022.00 TO NODE 21023.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1433.00 DOWNSTREAM ELEVATION(FEET) = 1416.00
 STREET LENGTH (FEET) = 274.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                               20.46
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.39
   HALFSTREET FLOOD WIDTH (FEET) = 13.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.13
 STREET FLOW TRAVEL TIME (MIN.) = 0.84 Tc (MIN.) = 16.93
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.709
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                             αA
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     B 6.51 0.75
                                              0.250 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.37 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.311
```

```
EFFECTIVE AREA (ACRES) = 19.07 AREA-AVERAGED Fm (INCH/HR) = 0.24
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 19.1
                                PEAK FLOW RATE(CFS) =
                                                         25.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.37
 FLOW VELOCITY (FEET/SEC.) = 5.77 DEPTH*VELOCITY (FT*FT/SEC.) = 2.38
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21023.00 = 1192.68 FEET.
******************
 FLOW PROCESS FROM NODE 21023.00 TO NODE 21024.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1416.00 DOWNSTREAM ELEVATION(FEET) = 1402.00
 STREET LENGTH (FEET) = 250.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.68
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   29.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.70
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.53
 STREET FLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 17.66
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.667
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      B 6.35 0.75
                                                0.250
 MOBILE HOME PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.47 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.274
 SUBAREA AREA (ACRES) = 6.82 SUBAREA RUNOFF (CFS) = 8.97
 EFFECTIVE AREA(ACRES) = 25.89 AREA-AVERAGED Fm(INCH/HR) = 0.23
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.31
 TOTAL AREA (ACRES) = 25.9 PEAK FLOW RATE (CFS) = 33.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

File name: LR0210ZZ.RES

Page 12

Date: 04/21/2014

SUBAREA AREA (ACRES) = 7.88 SUBAREA RUNOFF (CFS) = 10.47

```
DEPTH(FEET) = 0.46 HALFSTREET FLOOD WIDTH(FEET) = 16.48
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 5.90 DEPTH*VELOCITY (FT*FT/SEC.) = 2.69
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21024.00 = 1443.07 FEET.
                                                                                  UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1385.00
                                                                                  STREET LENGTH (FEET) = 357.04 CURB HEIGHT (INCHES) = 6.0
******************
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21024.00 TO NODE 21025.00 IS CODE = 63
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1402.00 DOWNSTREAM ELEVATION(FEET) = 1390.00
 STREET LENGTH (FEET) = 390.63 CURB HEIGHT (INCHES) = 6.0
                                                                                  STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                                  Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                  MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                    ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREET FLOW DEPTH (FEET) = 0.58
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 22.10
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.01
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.33
                                                                                  STREET FLOW TRAVEL TIME (MIN.) = 1.48 Tc (MIN.) = 20.45
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 37.61
                                                                                  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.526
   ***STREET FLOWING FULL***
                                                                                  SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                       Fp
   STREET FLOW DEPTH(FEET) = 0.51
                                                                                      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   HALFSTREET FLOOD WIDTH (FEET) = 18.44
                                                                                  RESIDENTIAL
                                                                                  "3-4 DWELLINGS/ACRE" B 1.32 0.75 0.600
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.99
                                                                                                       B 1.20 0.75 0.100 56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.54
                                                                                  COMMERCIAL
 STREET FLOW TRAVEL TIME (MIN.) = 1.30 Tc (MIN.) = 18.96
                                                                                  MOBILE HOME PARK B 0.81
                                                                                                                          0.75 0.250 56
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.597
                                                                                  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.335
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
                                                                                  SUBAREA AREA (ACRES) = 3.33 SUBAREA RUNOFF (CFS) = 3.82
                                                                                  EFFECTIVE AREA(ACRES) = 36.62 AREA-AVERAGED Fm(INCH/HR) = 0.26
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                              4.17
                                      0.75 0.600 56
                                                                                  TOTAL AREA(ACRES) = 36.6 PEAK FLOW RATE(CFS) = 41.90
 MOBILE HOME PARK B 3.23
                                      0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.447
                                                                                  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 SUBAREA AREA(ACRES) = 7.40 SUBAREA RUNOFF(CFS) = 8.41
 EFFECTIVE AREA(ACRES) = 33.29 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                                  END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
                                                                                  DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.04
                                                                                  FLOW VELOCITY (FEET/SEC.) = 4.01 DEPTH*VELOCITY (FT*FT/SEC.) = 2.33
 TOTAL AREA (ACRES) = 33.3 PEAK FLOW RATE (CFS) =
                                                       40.19
                                                                                  LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21026.00 = 2190.74 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                                 ******************
                                                                                  FLOW PROCESS FROM NODE 21026.00 TO NODE 21027.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 18.87
                                                                                  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 5.12 DEPTH*VELOCITY (FT*FT/SEC.) = 2.65
                                                                                  >>>> (STREET TABLE SECTION # 5 USED) <<<<
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21025.00 = 1833.70 FEET.
                                                                                 ______
                                                                                  UPSTREAM ELEVATION(FEET) = 1385.00 DOWNSTREAM ELEVATION(FEET) = 1374.00
STREET LENGTH (FEET) = 355.39 CURB HEIGHT (INCHES) = 6.0
                                                                                  STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21025.00 TO NODE 21026.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
```

File name: LR0210ZZ.RES

Date: 04/21/2014

56

Page 14

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                      49.60
                                                                                     ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                     STREET FLOW DEPTH (FEET) = 0.58
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 22.10
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.72
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.80
                                                                                    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.75
                                                                                   STREET FLOW TRAVEL TIME (MIN.) = 1.09 Tc (MIN.) = 22.64
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 45.17
                                                                                   * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.436
   ***STREET FLOWING FULL***
                                                                                   SUBAREA LOSS RATE DATA (AMC II):
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                   DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                       LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.53
  HALFSTREET FLOOD WIDTH (FEET) = 19.60
                                                                                   RESIDENTIAL
                                                                                   "3-4 DWELLINGS/ACRE" B 2.72 0.75 0.600
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.37
                                                                                                                                           56
                                                                                                                2.05 0.75 0.100 56
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86
                                                                                   COMMERCIAL
                                                                                                        В
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc(MIN.) = 21.55
                                                                                   MOBILE HOME PARK
                                                                                                        В
                                                                                                                0.45 0.75 0.250 56
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.479
                                                                                   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                                                   SUBAREA AREA(ACRES) = 5.22
                                                                                                                 SUBAREA RUNOFF(CFS) = 5.43
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                   EFFECTIVE AREA (ACRES) = 47.73 AREA-AVERAGED Fm(INCH/HR) = 0.26
 RESIDENTIAL
                                                                                   AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
 "3-4 DWELLINGS/ACRE" B 2.67 0.75 0.600 56
                                                                                   TOTAL AREA (ACRES) = 47.7 PEAK FLOW RATE (CFS) =
                                                                                                                                            50.66
                               3.22
 COMMERCIAL
                       В
                                      0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                   SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                   5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.327
 SUBAREA AREA (ACRES) = 5.89 SUBAREA RUNOFF (CFS) = 6.54
 EFFECTIVE AREA(ACRES) = 42.51 AREA-AVERAGED Fm(INCH/HR) = 0.25
                                                                                   END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
                                                                                   DEPTH(FEET) = 0.59 HALFSTREET FLOOD WIDTH(FEET) = 22.28
 TOTAL AREA (ACRES) = 42.5 PEAK FLOW RATE (CFS) =
                                                                                   FLOW VELOCITY (FEET/SEC.) = 4.75 DEPTH*VELOCITY (FT*FT/SEC.) = 2.78
                                                                                   LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21028.00 = 2855.86 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 ******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                                   FLOW PROCESS FROM NODE 21028.00 TO NODE 21029.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.90
                                                                                   >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 5.42 DEPTH*VELOCITY (FT*FT/SEC.) = 2.91
                                                                                   >>>> (STREET TABLE SECTION # 2 USED) <<<<
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21027.00 = 2546.13 FEET.
                                                                                 ______
                                                                                   UPSTREAM ELEVATION(FEET) = 1368.00 DOWNSTREAM ELEVATION(FEET) = 1363.00
**********************
                                                                                   STREET LENGTH (FEET) = 301.04 CURB HEIGHT (INCHES) = 8.0
                                                                                   STREET HALFWIDTH (FEET) = 20.00
 FLOW PROCESS FROM NODE 21027.00 TO NODE 21028.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                                   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                   OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
______
 UPSTREAM ELEVATION(FEET) = 1374.00 DOWNSTREAM ELEVATION(FEET) = 1368.00
 STREET LENGTH (FEET) = 309.73 CURB HEIGHT (INCHES) = 6.0
                                                                                   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 18.00
                                                                                   STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                   Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                   MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                                                                      53.30
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                     ***STREET FLOWING FULL***
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                     STREET FLOW DEPTH(FEET) = 0.64
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                    HALFSTREET FLOOD WIDTH (FEET) = 20.00
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                    AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.57
```

Page 16

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.92
                                                                              RESIDENTIAL.
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 23.74
                                                                              "3-4 DWELLINGS/ACRE" B 27.42
                                                                                                                    0.75 0.600
                                                                              MOBILE HOME PARK B 2.60 0.75 0.250 56
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.395
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.455
                                      Fρ
                                             Дp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              SUBAREA AREA (ACRES) = 39.70 SUBAREA RUNOFF (CFS) = 36.58
                                                                              EFFECTIVE AREA(ACRES) = 92.56 AREA-AVERAGED Fm(INCH/HR) = 0.29
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            2.13
                                       0.75
                                               0.600 56
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 COMMERCIAL B
MOBILE HOME PARK B
                             2.11
                                       0.75 0.100 56
                                                                              TOTAL AREA (ACRES) = 92.6 PEAK FLOW RATE (CFS) = 89.31
 MOBILE HOME PARK
                              0.89
                                       0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.334
 SUBAREA AREA(ACRES) = 5.13
                             SUBAREA RUNOFF(CFS) = 5.29
 EFFECTIVE AREA(ACRES) = 52.86 AREA-AVERAGED Fm(INCH/HR) = 0.26
                                                                              END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.34
                                                                              DEPTH (FEET) = 0.63 HALFSTREET FLOOD WIDTH (FEET) = 24.48
                                                                              FLOW VELOCITY (FEET/SEC.) = 7.02 DEPTH*VELOCITY (FT*FT/SEC.) = 4.42
 TOTAL AREA(ACRES) = 52.9 PEAK FLOW RATE(CFS) =
                                                       54.22
                                                                              *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                    AND L = 360.4 FT WITH ELEVATION-DROP = 13.0 FT, IS 99.1 CFS,
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                                    WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21030.00
                                                                              LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21030.00 = 3517.25 FEET.
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                             ******************
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 20.00
 FLOW VELOCITY (FEET/SEC.) = 4.61 DEPTH*VELOCITY (FT*FT/SEC.) = 2.96
                                                                              FLOW PROCESS FROM NODE 21030.00 TO NODE 21031.00 IS CODE = 48
 LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21029.00 = 3156.90 FEET.
                                                                              >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
********************
                                                                              >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 FLOW PROCESS FROM NODE 21029.00 TO NODE 21030.00 IS CODE = 63
                                                                             ______
______
                                                                              ELEVATION DATA: UPSTREAM(FEET) = 1350.00 DOWNSTREAM(FEET) = 1340.00
                                                                              FLOW LENGTH (FEET) = 474.31 MANNING'S N = 0.014
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 2.50
_____
                                                                              FLOWDEPTH IN BOX IS 1.11 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 13.40
                                                                                                89.31
 UPSTREAM ELEVATION(FEET) = 1363.00 DOWNSTREAM ELEVATION(FEET) = 1350.00
                                                                              BOX-FLOW(CFS) =
 STREET LENGTH (FEET) = 360.35 CURB HEIGHT (INCHES) = 6.0
                                                                              BOX-FLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 25.24
 STREET HALFWIDTH (FEET) = 18.00
                                                                              LONGEST FLOWPATH FROM NODE 21020.00 TO NODE 21031.00 = 3991.56 FEET.
                                                                             DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              FLOW PROCESS FROM NODE 21031.00 TO NODE 21031.00 IS CODE = 81
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                             STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                              MAINLINE Tc(MIN.) = 25.24
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                              * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.345
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.76
                                                                               DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fp
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                  LAND USE
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 72.51
                                                                              RESIDENTIAL
   ***STREET FLOWING FULL***
                                                                              "3-4 DWELLINGS/ACRE" B 2.14 0.75 0.600
                                                                                                                                   56
                                                                                                  B 3.35 0.75 0.100 56
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              COMMERCIAL
   STREET FLOW DEPTH (FEET) = 0.59
                                                                              SCHOOL
                                                                                                    В
                                                                                                            0.63
                                                                                                                    0.75 0.600
   HALFSTREET FLOOD WIDTH (FEET) = 22.65
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.60
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.326
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.91
                                                                              SUBAREA AREA (ACRES) = 6.12 SUBAREA RUNOFF (CFS) = 6.06
 STREET FLOW TRAVEL TIME (MIN.) = 0.91 Tc (MIN.) = 24.65
                                                                              EFFECTIVE AREA(ACRES) = 98.68 AREA-AVERAGED Fm(INCH/HR) = 0.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.364
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              TOTAL AREA (ACRES) = 98.7 PEAK FLOW RATE (CFS) =
                                                                                                                                 93.78
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 COMMERCIAL
                     В
                              9.68 0.75
                                             0.100 56
                                                                              5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
```

Date: 04/21/2014 File name: LR0210ZZ.RES

Page 18

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>

\_\_\_\_\_

MAINLINE Tc(MIN.) = 25.24

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.345

DEVELOPMENT TYPE/ SCS SOIL AREA FO

SUBAREA LOSS RATE DATA (AMC II):

			- I-	1-	
LAND USE	GROUP (.	ACRES)	(INCH/HR)	(DECIMAL)	CN
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	В	0.62	0.75	0.600	56
SCHOOL	В	1.27	0.75	0.600	56
SUBAREA AVERAGE PERVIOU	S LOSS RATE	, Fp(INC	H/HR) = 0	.75	

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600

SUBAREA AREA (ACRES) = 1.89 SUBAREA RUNOFF (CFS) = 1.52

EFFECTIVE AREA(ACRES) = 100.57 AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.39

TOTAL AREA(ACRES) = 100.6 PEAK FLOW RATE(CFS) = 95.30

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* .\_\_\_\_\_

FLOW PROCESS FROM NODE 21032.00 TO NODE 21032.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<

>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES

\_\_\_\_\_

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:

TIME OF CONCENTRATION (MIN.) = 25.24

RAINFALL INTENSITY (INCH/HR) = 1.34

AREA-AVERAGED Fm(INCH/HR) = 0.29

AREA-AVERAGED Fp (INCH/HR) = 0.75

AREA-AVERAGED Ap = 0.39

EFFECTIVE STREAM AREA(ACRES) = 100.57

TOTAL STREAM AREA(ACRES) = 100.57

PEAK FLOW RATE (CFS) AT CONFLUENCE = 95.30

\*\* CONFLUENCE DATA \*\*

STREAM	Q		Intensity	1 '	Ар		HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	67.85	28.75	1.244	0.75( 0.40)	0.54	89.5	21010.00
1	67.45	29.16	1.233	0.75( 0.40)	0.54	90.2	21000.00
2	95.30	25.24	1.345	0.75(0.29)	0.39	100.6	21020.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO CONFLUENCE FORMULA USED FOR 2 STREAMS.

\*\* PEAK FLOW RATE TABLE \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	162.02	25.24	1.345	0.75(0.34)	0.45	179.2	21020.00
2	154.01	28.75	1.244	0.75(0.34)	0.46	190.1	21010.00
3	152.66	29.16	1.233	0.75( 0.34)	0.46	190.7	21000.00

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 162.02 Tc (MIN.) = 25.24
 EFFECTIVE AREA(ACRES) = 179.18 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA(ACRES) = 190.7
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21032.00 = 6309.36 FEET.
******************
 FLOW PROCESS FROM NODE 21032.00 TO NODE 21043.00 IS CODE = 48
______
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
 ELEVATION DATA: UPSTREAM(FEET) = 1332.00 DOWNSTREAM(FEET) = 1327.00
 FLOW LENGTH (FEET) = 353.61 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 11.00 GIVEN BOX HEIGHT (FEET) = 2.50
 FLOWDEPTH IN BOX IS 1.19 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 12.43
 BOX-FLOW(CFS) = 162.02
 BOX-FLOW TRAVEL TIME (MIN.) = 0.47 Tc (MIN.) = 25.72
 LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.
******************
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 25.72
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.330
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
                    в 2.84
 "3-4 DWELLINGS/ACRE"
                                      0.75
                                             0.600
                                                    56
 SCHOOL
                     В
                            2.77 0.75
                                             0.600
                                                    56
 COMMERCIAL
                     В
                            2.00
                                      0.75
                                             0.100
                                                    56
 MOBILE HOME PARK
                      В
                             6.89
                                      0.75
                                             0.250
                                                    56
                             1.56
                                      0.75 0.850
 PUBLIC PARK
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.412
 SUBAREA AREA(ACRES) = 16.06
                           SUBAREA RUNOFF(CFS) = 14.77
 EFFECTIVE AREA(ACRES) = 195.24 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA (ACRES) = 206.8 PEAK FLOW RATE (CFS) = 174.38
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  1
          174.51 25.69 1.331 0.75(0.34) 0.45 195.2 21020.00
         165.46 29.19 1.233 0.75(0.34) 0.46 206.2 21010.00
         164.10 29.57 1.223 0.75(0.34) 0.46 206.8 21000.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) = 174.51 Tc(MIN.) = 25.69
 AREA-AVERAGED Fm(INCH/HR) = 0.34 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45 EFFECTIVE AREA(ACRES) = 195.24
```

File name: LR0210ZZ.RES

Page 20

Date: 04/21/2014

Date: 04/21/2014 Page 19 File name: LR021077.RFS

```
******************
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 25.69
 RAINFALL INTENSITY (INCH/HR) = 1.33
 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.45
 EFFECTIVE STREAM AREA(ACRES) = 195.24
 TOTAL STREAM AREA(ACRES) = 206.80
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 174.51
******************
 FLOW PROCESS FROM NODE 21040.00 TO NODE 21041.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 905.71
 ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1350.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.925
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.109
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fр
                                           Ap SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 COMMERCIAL
                    в 7.08
                                     0.75
                                            0.100
                                                 56 11.92
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.20
                                    0.75
                                            0.600 56 16.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
 SUBAREA RUNOFF (CFS) = 19.24
 TOTAL AREA(ACRES) = 11.28 PEAK FLOW RATE(CFS) = 19.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
*********************
 FLOW PROCESS FROM NODE 21041.00 TO NODE 21042.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1350.00 DOWNSTREAM ELEVATION(FEET) = 1341.00
 STREET LENGTH (FEET) = 642.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 18.81
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.44
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.78
 STREET FLOW TRAVEL TIME (MIN.) = 3.11 Tc (MIN.) = 15.03
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.835
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             4.00
                                    0.75 0.600
                                                      56
 COMMERCIAL
                             5.39
                                     0.75 0.100
                                                      56
                               1.37
                                     0.75
                                               0.600 56
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
 SUBAREA AREA (ACRES) = 10.76 SUBAREA RUNOFF (CFS) = 15.24
 EFFECTIVE AREA(ACRES) = 22.04 AREA-AVERAGED Fm(INCH/HR) = 0.24
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.32
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) = 31.70
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.90
 FLOW VELOCITY (FEET/SEC.) = 3.66 DEPTH*VELOCITY (FT*FT/SEC.) = 1.97
 LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21042.00 = 1548.21 FEET.
******************
 FLOW PROCESS FROM NODE 21042.00 TO NODE 21043.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1341.00 DOWNSTREAM(FEET) = 1327.00
 FLOW LENGTH (FEET) = 896.68 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 5.00 GIVEN BOX HEIGHT (FEET) = 3.00
 FLOWDEPTH IN BOX IS 0.71 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 8.90
 BOX-FLOW(CFS) =
                  31.70
 BOX-FLOW TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 16.71
 LONGEST FLOWPATH FROM NODE 21040.00 TO NODE 21043.00 = 2444.89 FEET.
******************
 FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_______
 MAINLINE Tc(MIN.) = 16.71
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.722
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
```

Page 22

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180

LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN COMMERCIAL B 0.11 0.75 0.100 56	**************************************
RESIDENTIAL	
"3-4 DWELLINGS/ACRE" B 2.51 0.75 0.600 56	>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA
SCHOOL B 2.94 0.75 0.600 56	>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.590	ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1318.00
SUBAREA AREA(ACRES) = 5.56 SUBAREA RUNOFF(CFS) = 6.41	FLOW LENGTH (FEET) = 665.51 MANNING'S N = 0.014
EFFECTIVE AREA(ACRES) = 27.60 AREA-AVERAGED Fm(INCH/HR) = 0.28	GIVEN BOX BASEWIDTH(FEET) = 12.00 GIVEN BOX HEIGHT(FEET) = 2.50
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.37	FLOWDEPTH IN BOX IS 1.30 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 12.86
TOTAL AREA (ACRES) = 27.6 PEAK FLOW RATE (CFS) = 35.87	BOX-FLOW(CFS) = 200.65
	BOX-FLOW TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 26.55
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):	LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET.
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44	***************************************
***************	
FLOW PROCESS FROM NODE 21043.00 TO NODE 21043.00 IS CODE = 1	FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 81
	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<	
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<	MAINLINE Tc(MIN.) = 26.55  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.305
TOTAL NUMBER OF STREAMS = 2	SUBAREA LOSS RATE DATA (AMC II):
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:	
TIME OF CONCENTRATION (MIN.) = 16.71	DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RAINFALL INTENSITY (INCH/HR) = 1.72	RESIDENTIAL
AREA-AVERAGED Fm(INCH/HR) = 0.28	"3-4 DWELLINGS/ACRE" B 4.70 0.75 0.600 56
AREA-AVERAGED Fm(INCH/HR) = 0.75	COMMERCIAL B 13.39 0.75 0.100 56
AREA-AVERAGED Ap = 0.37	SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
EFFECTIVE STREAM AREA (ACRES) = 27.60	SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.230
TOTAL STREAM AREA (ACRES) = 27.60	SUBAREA AREA (ACRES) = 18.09 SUBAREA RUNOFF (CFS) = 18.44
PEAK FLOW RATE (CFS) AT CONFLUENCE = 35.87	EFFECTIVE AREA(ACRES) = 240.93 AREA-AVERAGED Fm(INCH/HR) = 0.32
33.00	AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.43
** CONFLUENCE DATA **	TOTAL AREA (ACRES) = 252.5 PEAK FLOW RATE (CFS) = 213.86
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER	
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
1 174.51 25.69 1.331 0.75(0.34) 0.45 195.2 21020.00	5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
1 165.46 29.19 1.233 0.75(0.34) 0.46 206.2 21010.00	
1 164.10 29.57 1.223 0.75(0.34) 0.46 206.8 21000.00	** PEAK FLOW RATE TABLE **
2 35.87 16.71 1.722 0.75( 0.28) 0.37 27.6 21040.00	STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER
	NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO	1 211.75 17.54 1.673 0.75(0.31) 0.42 172.7 21040.00
CONFLUENCE FORMULA USED FOR 2 STREAMS.	2 214.41 26.47 1.307 0.75(0.32) 0.43 240.9 21020.00
	3 202.20 29.94 1.214 0.75 (0.32) 0.43 251.9 21010.00
** PEAK FLOW RATE TABLE **	4 200.72 30.29 1.206 0.75(0.32) 0.43 252.5 21000.00
STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER	NEW PEAK FLOW DATA ARE:
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 194.17 16.71 1.722 0.75(0.33) 0.44 154.6 21040.00	PEAK FLOW RATE (CFS) = 214.41 Tc (MIN.) = 26.47  AREA-AVERAGED Fm (INCH/HR) = 0.32 AREA-AVERAGED Fp (INCH/HR) = 0.75
2 200.65 25.69 1.331 0.75(0.33) 0.44 134.6 21040.00	AREA-AVERAGED FM (INCH/HR) = 0.32 AREA-AVERAGED FP (INCH/HR) = 0.75  AREA-AVERAGED Ap = 0.43 EFFECTIVE AREA(ACRES) = 240.93
3 189.17 29.19 1.233 0.75(0.33) 0.45 233.8 21010.00	ANDA-AVERAGED AP - 0.43 EFFECTIVE AREA (ACRES) = 240.33
4 187.57 29.57 1.223 0.75(0.33) 0.45 233.6 21010.00	******************
± 107.37 23.37 1.223 0.73 (0.33) 0.43 234.4 21000.00	FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 10
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:	
PEAK FLOW RATE (CFS) = 200.65 Tc (MIN.) = 25.69	>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
EFFECTIVE AREA (ACRES) = 222.84 AREA-AVERAGED Fm (INCH/HR) = 0.33	======================================
AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.44	
TOTAL AREA (ACRES) = 234.4	********************
LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21043.00 = 6662.97 FEET.	FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 15.1

```
TO NODE 21044.00 IS CODE = 48
                         _____
                         THRU SUBAREA<
                         ZE (EXISTING ELEMENT) <
                         _____
                         1327.00 DOWNSTREAM(FEET) = 1318.00
                         ANNING'S N = 0.014
                         00 GIVEN BOX HEIGHT (FEET) = 2.50
                        BOX-FLOW VELOCITY (FEET/SEC.) = 12.86
                        .86 Tc(MIN.) = 26.55
                         .00 TO NODE 21044.00 = 7328.48 FEET.
                         ***********
                         TO NODE 21044.00 IS CODE = 81
                         _____
                        LINE PEAK FLOW<
                         -----
                         CH/HR) = 1.305
                          AREA
                                Fр
                                       Аp
                                               SCS
                         (ACRES) (INCH/HR) (DECIMAL) CN
                          4.70
                                  0.75 0.600
                                                56
                          13.39
                                  0.75 0.100 56
                         ^{\circ}E, ^{\circ}Fp(INCH/HR) = 0.75
                         ACTION, Ap = 0.230
                          SUBAREA RUNOFF(CFS) = 18.44
                          AREA-AVERAGED Fm(INCH/HR) = 0.32
                          AREA-AVERAGED Ap = 0.43
                            PEAK FLOW RATE (CFS) = 213.86
                         EPTH (INCH):
                         ); 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                        ity Fp(Fm)
                                        Ae
                                               HEADWATER
                                         (ACRES) NODE
                        HR) (INCH/HR)
                        73 0.75 (0.31) 0.42
                                         172.7 21040.00
                        07 0.75 ( 0.32) 0.43
                                          240.9 21020.00
                                          251.9 21010.00
                         4 0.75 ( 0.32) 0.43
                         06 0.75 ( 0.32) 0.43
                                           252.5 21000.00
                         Tc(MIN.) = 26.47
                          AREA-AVERAGED Fp (INCH/HR) = 0.75
                         IVE AREA (ACRES) = 240.93
                         *********
                         TO NODE 21044.00 IS CODE = 10
                         TO MEMORY BANK # 1 <<<<
                         -----
                         *************
FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 15.1
```

File name: LR0210ZZ.RES

Date: 04/21/2014

Date: 04/21/2014 File name: LR0210ZZ.RES Page 23 Page 24

```
202.20 29.94 1.214 0.75(0.32) 0.43 251.9 21010.00
 >>>>DEFINE MEMORY BANK # 2 <<<<
                                                                           4
                                                                                 200.72 30.29
                                                                                             1.206 0.75(0.32) 0.43 252.5 21000.00
 PEAK FLOWRATE TABLE FILE NAME: 20968.DNA
                                                                        LONGEST FLOWPATH FROM NODE 21000.00 TO NODE 21044.00 = 7328.48 FEET.
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3350.10 Tc (MIN.) = 55.33
                                                                        COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.60
                                                                        UNIT-HYDROGRAPH DATA:
 TOTAL AREA(ACRES) = 10106.9
                                                                        RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.04;24H= 4.19
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
                                                                        S-GRAPH: VALLEY(DEV.) = 69.9%; VALLEY(UNDEV.) / DESERT = 30.1%
                                                                               MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
*******************
                                                                        Tc(HR) = 0.93; LAG(HR) = 0.75; Fm(INCH/HR) = 0.51; Ybar = 0.60
                                                                        USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 14.0
                                                                        DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.67;
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
                                                                        3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                        UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10359.4
______
                                                                        LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
                                                                         EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                         Lca/L=0.3, n=.0312; Lca/L=0.4, n=.0280; Lca/L=0.5, n=.0257; Lca/L=0.6, n=.0240
 PEAK FLOW RATE (CFS) = 3350.10 Tc (MIN.) = 55.33
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.60
                                                                        TIME OF PEAK FLOW(HR) = 16.75 RUNOFF VOLUME(AF) = 1488.52
 TOTAL AREA (ACRES) = 10106.9
                                                                        PEAK FLOW RATE (CFS) = 3381.38
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 20968.00 = 37082.74 FEET.
                                                                       ******************
******************
                                                                         FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 12
 FLOW PROCESS FROM NODE 20968.00 TO NODE 20968.00 IS CODE = 12
                                                                       ______
                                                                        >>>>CLEAR MEMORY BANK # 1 <<<<
 >>>>CLEAR MEMORY BANK # 2 <<<<
                                                                       ______
______
                                                                       *****
******************
                                                                        FLOW PROCESS FROM NODE 21044.00 TO NODE 21045.00 IS CODE = 54
 FLOW PROCESS FROM NODE 20968.00 TO NODE 21044.00 IS CODE = 48
                                                                        >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                        >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                       ______
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1318.00 DOWNSTREAM(FEET) = 1295.00
ELEVATION DATA: UPSTREAM(FEET) = 1335.00 DOWNSTREAM(FEET) = 1318.00
                                                                        CHANNEL LENGTH THRU SUBAREA (FEET) = 1385.05 CHANNEL SLOPE = 0.0166
 FLOW LENGTH (FEET) = 1136.29 MANNING'S N = 0.014
                                                                        CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000
 GIVEN BOX BASEWIDTH(FEET) = 23.00 GIVEN BOX HEIGHT(FEET) = 10.00
                                                                        MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50
 FLOWDEPTH IN BOX IS 4.92 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 29.62
                                                                        CHANNEL FLOW THRU SUBAREA(CFS) = 3381.38
 BOX-FLOW(CFS) = 3350.10
                                                                        FLOW VELOCITY (FEET/SEC.) = 28.12 FLOW DEPTH (FEET) = 4.86
                                                                        TRAVEL TIME (MIN.) = 0.82 Tc (MIN.) = 56.80
 BOX-FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 55.97
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
                                                                        LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET.
******************
                                                                       ******************
 FLOW PROCESS FROM NODE 21044.00 TO NODE 21044.00 IS CODE = 11
                                                                        FLOW PROCESS FROM NODE 21045.00 TO NODE 21045.00 IS CODE = 81
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
                                                                       ______
                                                                        MAINLINE Tc(MIN.) = 56.80
 ** MAIN STREAM CONFLUENCE DATA **
                                                                        * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.827
 PEAK FLOW RATE(CFS) = 3350.10
                            Tc(MIN.) = 55.97
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 AREA-AVERAGED Fm(INCH/HR) = 0.52 Ybar = 0.60
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                         SCS
                                                                                                           Fρ
                                                                                                                   αA
 TOTAL AREA (ACRES) = 10106.9
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LAND USE
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21044.00 = 38219.03 FEET.
                                                                        RESIDENTIAL
                                                                        "5-7 DWELLINGS/ACRE"
                                                                                                   25.15
                                                                                                            0.98
                                                                                                                  0.500
                                                                                                                         32
 ** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                                                   34.08
                                                                                                            0.98
                                                                                                                   0.100
                                                                                                                         32
                                                                        COMMERCIAL
                                                                                             Α
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                        SCHOOL
                                                                                             Α
                                                                                                    9.02
                                                                                                            0.98
                                                                                                                  0.600
                                                                                                                         32
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                     (ACRES) NODE
                                                                        RESIDENTIAL
    1
         211.75 17.54 1.673 0.75(0.31) 0.42 172.7 21040.00
                                                                        "3-4 DWELLINGS/ACRE"
                                                                                             A
                                                                                                  6.36
                                                                                                            0.98
                                                                                                                  0.600
                                                                                                                         32
         214.41 26.47 1.307 0.75(0.32) 0.43
                                            240.9 21020.00
                                                                        COMMERCIAL
                                                                                             В
                                                                                                   60.62
                                                                                                            0.75
                                                                                                                  0.100
                                                                                                                         56
```

Page 25

Date: 04/21/2014

File name: LR0210ZZ.RES

Page 26

```
RESIDENTIAL.
                                                                               MOBILE HOME PARK
                                                                                                    В
                                                                                                           0.52 0.75 0.250
 "3-4 DWELLINGS/ACRE" B 23.64 0.75 0.600 56
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.90
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.87
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.254
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.286
                                                                               * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
                                                                               * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
                                                                               SUBAREA AREA(ACRES) = 82.42
 SUBAREA AREA(ACRES) = 158.87
                                                                               UNIT-HYDROGRAPH DATA:
                                                                               RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.04;24H= 4.17
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.04;24H= 4.18
                                                                               S-GRAPH: VALLEY (DEV.) = 70.6%; VALLEY (UNDEV.) / DESERT = 29.4%
 S-GRAPH: VALLEY (DEV.) = 70.4%; VALLEY (UNDEV.) / DESERT= 29.6%
                                                                                       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                               Tc(HR) = 0.97; LAG(HR) = 0.78; Fm(INCH/HR) = 0.51; Ybar = 0.59
                                                                               USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 Tc(HR) = 0.95; LAG(HR) = 0.76; Fm(INCH/HR) = 0.51; Ybar = 0.60
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                               DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
                                                                               3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                               UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10600.7
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10518.3
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21045.00 = 39604.08 FEET.
                                                                                EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                                Lca/L=0.3,n=.0298; Lca/L=0.4,n=.0267; Lca/L=0.5,n=.0245; Lca/L=0.6,n=.0229
  Lca/L=0.3,n=.0307; Lca/L=0.4,n=.0275; Lca/L=0.5,n=.0253; Lca/L=0.6,n=.0236
                                                                               TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 1537.01
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 1520.04
                                                                               UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3461.47
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3418.66
                                                                               TOTAL AREA (ACRES) = 10600.7 PEAK FLOW RATE (CFS) = 3461.47
 TOTAL AREA (ACRES) = 10518.3 PEAK FLOW RATE (CFS) = 3418.66
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                              ************************
*****
                                                                                FLOW PROCESS FROM NODE 21046.00 TO NODE 21069.00 IS CODE = 54
                                                                              ______
 FLOW PROCESS FROM NODE 21045.00 TO NODE 21046.00 IS CODE = 54
                                                                               >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                               >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                              _____
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1250.00 DOWNSTREAM(FEET) = 1215.00
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1250.00
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 2718.03 CHANNEL SLOPE = 0.0129
 CHANNEL LENGTH THRU SUBAREA (FEET) = 2744.77 CHANNEL SLOPE = 0.0164
                                                                               CHANNEL BASE (FEET) = 18.00 "Z" FACTOR = 2.000
 CHANNEL BASE (FEET) = 15.00 "Z" FACTOR = 2.000
                                                                               MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 7.50
                                                                               CHANNEL FLOW THRU SUBAREA (CFS) = 3461.47
                                                                               FLOW VELOCITY (FEET/SEC.) = 25.46 FLOW DEPTH (FEET) = 4.89
 CHANNEL FLOW THRU SUBAREA(CFS) = 3418.66
 FLOW VELOCITY (FEET/SEC.) = 28.11 FLOW DEPTH (FEET) = 4.90
                                                                               TRAVEL TIME (MIN.) = 1.78 Tc (MIN.) = 60.20
 TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 58.42
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21046.00 = 42348.85 FEET.
                                                                              ******************
*****************
                                                                               FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 81
 FLOW PROCESS FROM NODE 21046.00 TO NODE 21046.00 IS CODE = 81
                                                                               >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                              ______
_____
                                                                               MAINLINE Tc (MIN.) = 60.20
 MAINLINE Tc(MIN.) = 58.42
                                                                               * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.798
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.813
                                                                               SUBAREA LOSS RATE DATA (AMC II):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                DEVELOPMENT TYPE/
                                                                                                   SCS SOIL AREA
                                                                                                                   Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS
                                                                                 LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                       Fρ
                                               αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               RESIDENTIAL
     LAND USE
                                               0.100 32
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                    В
                                                                                                         5.29
                                                                                                                      0.75
 COMMERCIAL
                      A
                              22.52
                                        0.98
 RESIDENTIAL
                                                                               COMMERCIAL
                                                                                                    В
                                                                                                            24.38
                                                                                                                      0.75
 "3-4 DWELLINGS/ACRE"
                        A
                              7.83
                                        0.98
                                               0.600 32
                                                                                                            9.45
                                                                                                                      0.98
                                                                               COMMERCIAL
                                                                                                     A
 COMMERCIAL
                        В
                               38.49
                                        0.75
                                               0.100
                                                       56
                                                                               RESIDENTIAL
                       A
                               8.61
                                        0.98
                                               0.850
                                                     32
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                    A 1.36
                                                                                                                      0.98
 PUBLIC PARK
 RESIDENTIAL
                                                                               PUBLIC PARK
                                                                                                      A
                                                                                                             5.30
                                                                                                                      0.98
 "3-4 DWELLINGS/ACRE"
                               4.45
                                        0.75
                                               0.600 56
                                                                               PUBLIC PARK
                                                                                                      В
                                                                                                             0.69
                                                                                                                      0.75
```

Page 27

Date: 04/21/2014

File name: LR0210ZZ.RES

56

Aр

0.600

0.100

0.100

0.600

0.850

0.850

File name: LR0210ZZ.RES

Date: 04/21/2014

56

32

32

32

Page 28

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.268
 * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
 * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
 SUBAREA AREA(ACRES) = 46.47
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.04;24H= 4.17
 S-GRAPH: VALLEY(DEV.) = 70.7%; VALLEY(UNDEV.) / DESERT = 29.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.51; Ybar = 0.59
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10647.2
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239; Lca/L=0.6,n=.0223
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 1546.49
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3426.25
 TOTAL AREA(ACRES) = 10647.2
                             PEAK FLOW RATE(CFS) = 3461.47
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
FLOW PROCESS FROM NODE 21050.00 TO NODE 21050.50 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 520.56
 ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1250.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.396
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.433
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                             Aр
                                                     SCS Tc
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    A
                             2.98
                                       0.98
                                               0.500 32 12.02
                      A
                                                     32 9.40
 COMMERCIAL
                              5.49
                                       0.98
                                               0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    A 0.85
                                       0.98
                                             0.600 32 12.73
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA RUNOFF (CFS) = 18.17
 TOTAL AREA(ACRES) = 9.32 PEAK FLOW RATE(CFS) = 18.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
       Date: 04/21/2014
```

```
FLOW PROCESS FROM NODE 21050.50 TO NODE 21051.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION (FEET) = 1250.00 DOWNSTREAM ELEVATION (FEET) = 1246.00
 STREET LENGTH (FEET) = 343.10 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 19.23
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.23
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.70
 STREET FLOW TRAVEL TIME (MIN.) = 1.77 Tc(MIN.) = 11.17
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.194
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                     SCS SOIL AREA
                                       Fp
     LAND USE
                       GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 2.98 0.98 COMMERCIAL A 5.50 0.98
                                                   0.500
                                                            32
                                                   0.100
                                                            32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 0.85 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.273
 SUBAREA AREA (ACRES) = 9.33 SUBAREA RUNOFF (CFS) = 16.19
 EFFECTIVE AREA(ACRES) = 18.65 AREA-AVERAGED Fm(INCH/HR) = 0.27
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 18.6 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.76
 FLOW VELOCITY (FEET/SEC.) = 3.46 DEPTH*VELOCITY (FT*FT/SEC.) = 1.92
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21051.00 = 863.66 FEET.
*****************
 FLOW PROCESS FROM NODE 21051.00 TO NODE 21052.00 IS CODE = 63
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
```

\*

Date: 04/21/2014

File name: LR021077.RFS

```
_____
 UPSTREAM ELEVATION(FEET) = 1246.00 DOWNSTREAM ELEVATION(FEET) = 1236.00
 STREET LENGTH (FEET) = 756.64 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                48.49
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.12
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.51
 STREET FLOW TRAVEL TIME (MIN.) = 3.06 Tc (MIN.) = 14.23
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.897
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
                                                Ар
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                             1.87
                                        0.98
                                                0.500 32
                    A
                                                0.100 32
 COMMERCIAL
                              17.40
                                        0.98
 RESIDENTIAL
                    A 1.43
 "3-4 DWELLINGS/ACRE"
                                     0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.171
 SUBAREA AREA (ACRES) = 20.70 SUBAREA RUNOFF (CFS) = 32.24
 EFFECTIVE AREA(ACRES) = 39.35 AREA-AVERAGED Fm(INCH/HR) = 0.21
 AREA-AVERAGED Fp (INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.22
 TOTAL AREA (ACRES) = 39.3 PEAK FLOW RATE (CFS) = 59.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 25.46
 FLOW VELOCITY (FEET/SEC.) = 4.35 DEPTH*VELOCITY (FT*FT/SEC.) = 2.83
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 756.6 FT WITH ELEVATION-DROP = 10.0 FT, IS 40.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21052.00
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21052.00 = 1620.30 FEET.
******************
 FLOW PROCESS FROM NODE 21052.00 TO NODE 21067.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1236.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
```

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    85.75
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.74
   HALFSTREET FLOOD WIDTH (FEET) = 30.22
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.51
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.36
 STREET FLOW TRAVEL TIME (MIN.) = 5.29 Tc (MIN.) = 19.52
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.569
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                        A 17.32
                                         0.98
                                                 0.500
                                                         32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.30
                                         0.75
                                                 0.600
                                                         56
 RESIDENTIAL
                        B 5.92
                                                 0.500
                                                         56
 "5-7 DWELLINGS/ACRE"
                                         0.75
                        B
                               6.47
                                                 0.100
 COMMERCIAL
                                         0.75
                                                         56
 COMMERCIAL
                        A 13.55
                                         0.98
                                                 0.100
                                                         32
 RESIDENTIAL
                      A 1.00
 "3-4 DWELLINGS/ACRE"
                                         0.98
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.91
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.329
 SUBAREA AREA(ACRES) = 45.56
                               SUBAREA RUNOFF(CFS) = 52.08
 EFFECTIVE AREA(ACRES) = 84.91 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp(INCH/HR) = 0.93 AREA-AVERAGED Ap = 0.28
 TOTAL AREA (ACRES) = 84.9 PEAK FLOW RATE (CFS) = 100.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78 HALFSTREET FLOOD WIDTH(FEET) = 32.11
 FLOW VELOCITY (FEET/SEC.) = 4.69 DEPTH*VELOCITY (FT*FT/SEC.) = 3.67
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1432.8 FT WITH ELEVATION-DROP = 16.0 FT, IS 67.4 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21067.00
 LONGEST FLOWPATH FROM NODE 21050.00 TO NODE 21067.00 = 3053.14 FEET.
******************
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
```

File name: LR0210ZZ.RES

Page 32

STREET HALFWIDTH (FEET) = 18.00

TOTAL NUMBER OF STREAMS = 2

Date: 04/21/2014

Date: 04/21/2014 File name: LR0210ZZ.RES Page 31

STREET LENGTH (FEET) = 1432.84 CURB HEIGHT (INCHES) = 6.0

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 19.52
 RAINFALL INTENSITY (INCH/HR) = 1.57
 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.93
 AREA-AVERAGED Ap = 0.28
 EFFECTIVE STREAM AREA(ACRES) = 84.91
 TOTAL STREAM AREA(ACRES) = 84.91
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 100.08
*******************
 FLOW PROCESS FROM NODE 21060.00 TO NODE 21061.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 1000.00
 ELEVATION DATA: UPSTREAM(FEET) = 1268.00 DOWNSTREAM(FEET) = 1267.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 19.181
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.586
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Αp
                                                     SCS Tc
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.55
                                      0.98
                                              0.500 32 24.54
 RESIDENTIAL
                    A 1.16
 "3-4 DWELLINGS/ACRE"
                                      0.98
                                              0.600 32 26.00
                                              0.100 32 19.18
 COMMERCIAL
                      Α
                              6.97
                                      0.98
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.224
 SUBAREA RUNOFF(CFS) = 11.91
 TOTAL AREA (ACRES) = 9.68 PEAK FLOW RATE (CFS) = 11.91
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21061.00 TO NODE 21062.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1267.00 DOWNSTREAM ELEVATION (FEET) = 1266.00
 STREET LENGTH(FEET) = 371.00 CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
```

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  17.61
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 22.92
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.62
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.00
 STREET FLOW TRAVEL TIME (MIN.) = 3.82 Tc (MIN.) = 23.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.422
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.79
COMMERCIAL A 7.48
                                         0.98
                                                 0.500
                                         0.98
                                                 0.100
                                                         32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 1.27 0.98 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.228
 SUBAREA AREA(ACRES) = 10.54 SUBAREA RUNOFF(CFS) = 11.38
 EFFECTIVE AREA(ACRES) = 20.22 AREA-AVERAGED Fm(INCH/HR) = 0.22
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.23
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) =
                                                      21.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 24.97
 FLOW VELOCITY (FEET/SEC.) = 1.70 DEPTH*VELOCITY (FT*FT/SEC.) = 1.12
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21062.00 = 1371.00 FEET.
******************
 FLOW PROCESS FROM NODE 21062.00 TO NODE 21063.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1266.00 DOWNSTREAM ELEVATION(FEET) = 1265.00
 STREET LENGTH (FEET) = 228.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                    25.46
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.10
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.12
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 1.36
 STREET FLOW TRAVEL TIME (MIN.) = 1.79 Tc (MIN.) = 24.80
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 33 Date: 04/21/2014 File name: LR0210ZZ.RES Page 34

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.359
                                                                                RESIDENTIAL.
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                "3-4 DWELLINGS/ACRE" A 0.77 0.98 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.300
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA(ACRES) = 10.27 SUBAREA RUNOFF(CFS) = 9.48
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" A 1.53
                                               0.500 32
                                                                                EFFECTIVE AREA(ACRES) = 37.48 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                     0.98
                      A 4.98
                                        0.98
                                               0.100 32
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.25
 COMMERCIAL
                                                                                TOTAL AREA (ACRES) = 37.5 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
                                                                                                                                       36.39
 "3-4 DWELLINGS/ACRE" A 0.48
                                        0.98
                                               0.600 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.222
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 SUBAREA AREA (ACRES) = 6.99 SUBAREA RUNOFF (CFS) = 7.19
 EFFECTIVE AREA(ACRES) = 27.21 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.23
                                                                                DEPTH(FEET) = 0.56 HALFSTREET FLOOD WIDTH(FEET) = 20.29
 TOTAL AREA (ACRES) = 27.2 PEAK FLOW RATE (CFS) =
                                                                                FLOW VELOCITY (FEET/SEC.) = 4.23 DEPTH*VELOCITY (FT*FT/SEC.) = 2.38
                                                                                LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21064.00 = 1923.08 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                              FLOW PROCESS FROM NODE 21064.00 TO NODE 21065.00 IS CODE = 63
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                              _____
 DEPTH(FEET) = 0.66 HALFSTREET FLOOD WIDTH(FEET) = 24.97
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 FLOW VELOCITY (FEET/SEC.) = 2.17 DEPTH*VELOCITY (FT*FT/SEC.) = 1.43
                                                                               >>>> (STREET TABLE SECTION # 18 USED) <<<<
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21063.00 = 1599.50 FEET.
                                                                              _____
                                                                                UPSTREAM ELEVATION(FEET) = 1258.00 DOWNSTREAM ELEVATION(FEET) = 1254.00
******************
                                                                                STREET LENGTH (FEET) = 294.50 CURB HEIGHT (INCHES) = 8.0
 FLOW PROCESS FROM NODE 21063.00 TO NODE 21064.00 IS CODE = 63
                                                                                STREET HALFWIDTH (FEET) = 26.00
._____
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
_____
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 UPSTREAM ELEVATION(FEET) = 1265.00 DOWNSTREAM ELEVATION(FEET) = 1258.00
 STREET LENGTH (FEET) = 323.58 CURB HEIGHT (INCHES) = 8.0
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET HALFWIDTH (FEET) = 26.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.03
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                 STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 STREET FLOW DEPTH (FEET) = 0.62
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 23.16
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.64
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.91
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 27.45
                                                  32.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.279
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH(FEET) = 0.55
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
                                                                                                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   HALFSTREET FLOOD WIDTH (FEET) = 19.41
                                                                                   LAND USE
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.13
                                                                                RESIDENTIAL
                                                                                "5-7 DWELLINGS/ACRE"
                                                                                                    A 4.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
                                                                                                                      0.98
                                                                                                                              0.500
                                                                                                                                      32
 STREET FLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 26.10
                                                                                COMMERCIAL
                                                                                                    A 3.54
                                                                                                                      0.98
                                                                                                                              0.100
                                                                                                                                      32
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.318
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" A 1.55
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                                                      0.98 0.600
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.97
                                    Fр
                                           Ар
                                                      SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.372
 RESIDENTIAL
                                                                                SUBAREA AREA (ACRES) = 9.82 SUBAREA RUNOFF (CFS) = 8.10
 "5-7 DWELLINGS/ACRE"
                    A
                               4.16
                                        0.98
                                               0.500
                                                     32
                                                                                EFFECTIVE AREA(ACRES) = 47.30 AREA-AVERAGED Fm(INCH/HR) = 0.26
 COMMERCIAL
                      A
                               5.34
                                        0.98
                                               0.100 32
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
```

File name: LR0210ZZ.RES

Page 36

Date: 04/21/2014

```
TOTAL AREA (ACRES) = 47.3 PEAK FLOW RATE (CFS) = 43.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63 HALFSTREET FLOOD WIDTH(FEET) = 23.74
 FLOW VELOCITY (FEET/SEC.) = 3.70 DEPTH*VELOCITY (FT*FT/SEC.) = 2.34
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21065.00 = 2217.58 FEET.
*****************
 FLOW PROCESS FROM NODE 21065.00 TO NODE 21066.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1254.00 DOWNSTREAM ELEVATION(FEET) = 1230.00
 STREET LENGTH (FEET) = 1452.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.97
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.06
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.55
 STREET FLOW TRAVEL TIME (MIN.) = 5.97 Tc (MIN.) = 33.42
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.137
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                       0.98 0.600 32
 "3-4 DWELLINGS/ACRE"
                     A 2.04
                      A 5.75
                                      0.98 0.100 32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.231
 SUBAREA AREA (ACRES) = 7.79 SUBAREA RUNOFF (CFS) = 6.39
 EFFECTIVE AREA(ACRES) = 55.09 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.98 AREA-AVERAGED Ap = 0.27
 TOTAL AREA (ACRES) = 55.1 PEAK FLOW RATE (CFS) = 43.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 22.92
 FLOW VELOCITY (FEET/SEC.) = 3.99 DEPTH*VELOCITY (FT*FT/SEC.) = 2.46
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21066.00 = 3669.58 FEET.
```

```
FLOW PROCESS FROM NODE 21066.00 TO NODE 21067.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1230.00 DOWNSTREAM ELEVATION(FEET) = 1220.00
 STREET LENGTH (FEET) = 858.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.30
 STREET FLOW TRAVEL TIME (MIN.) = 4.07 Tc (MIN.) = 37.49
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.061
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
      LAND USE
 COMMERCIAL
                       в 1.85 0.75
                                                 0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.05 0.75 0.600 56
 COMMERCIAL
                              0.62
                                          0.98
                                                  0.100
                       A
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.80
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.110
 SUBAREA AREA(ACRES) = 2.52 SUBAREA RUNOFF(CFS) = 2.21
 EFFECTIVE AREA(ACRES) = 57.61 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp(INCH/HR) = 0.97 AREA-AVERAGED Ap = 0.26
 TOTAL AREA(ACRES) = 57.6 PEAK FLOW RATE(CFS) =
                                                           43.50
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.56
 FLOW VELOCITY (FEET/SEC.) = 3.49 DEPTH*VELOCITY (FT*FT/SEC.) = 2.27
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
******************
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21067.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
```

Page 38

\*

```
TOTAL NUMBER OF STREAMS = 2
                                                                               COMMERCIAL
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 37.49
 RAINFALL INTENSITY (INCH/HR) = 1.06
 AREA-AVERAGED Fm(INCH/HR) = 0.25
 AREA-AVERAGED Fp (INCH/HR) = 0.97
 AREA-AVERAGED Ap = 0.26
 EFFECTIVE STREAM AREA(ACRES) = 57.61
 TOTAL STREAM AREA(ACRES) = 57.61
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1 100.08 19.52 1.569 0.93(0.26) 0.28 84.9 21050.00
         43.50 37.49 1.061 0.97(0.25) 0.26 57.6 21060.00
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 ** PEAK FLOW RATE TABLE **
  STREAM Q To Intensity Fp(Fm) Ap Ae
                                                      HEADWATER
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          136.96 19.52 1.569 0.94(0.26) 0.27 114.9 21050.00
    2
          104.72 37.49 1.061 0.95(0.26) 0.27 142.5 21060.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 136.96 Tc (MIN.) = 19.52
 EFFECTIVE AREA(ACRES) = 114.91 AREA-AVERAGED Fm(INCH/HR) = 0.26
 AREA-AVERAGED Fp (INCH/HR) = 0.94 AREA-AVERAGED Ap = 0.27
 TOTAL AREA(ACRES) = 142.5
 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21067.00 = 4528.08 FEET.
******************
 FLOW PROCESS FROM NODE 21067.00 TO NODE 21068.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1220.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1217.50
 FLOW LENGTH (FEET) = 1347.88 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 84.0 INCH PIPE IS 41.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 7.14
 PIPE-FLOW(CFS) = 136.96
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 3.34 Tc (MIN.) = 22.86
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.427
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                qΑ
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" A 7.32
                                       0.98
                                               0.600
                                                     32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                             5.09
                                        0.75
                                               0.600
                                                       56
 COMMERCIAL
                               15.30
                                        0.98
                                               0.100 32
```

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.85 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189 SUBAREA AREA (ACRES) = 69.33 SUBAREA RUNOFF (CFS) = 79.00 EFFECTIVE AREA(ACRES) = 184.24 AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.24 TOTAL AREA (ACRES) = 211.9 PEAK FLOW RATE (CFS) = 199.96 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44 STREET CROSS-SECTION INFORMATION: CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00 INSIDE STREET CROSSFALL(DECIMAL) = 0.020 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200 \*NOTE: STREET-CAPACITY MAY BE EXCEEDED\* STREETFLOW HYDRAULICS BASED ON MAINLINE Tc : STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 63.00 \*\*\*STREET FLOWING FULL\*\*\* STREETFLOW MODEL RESULTS USING ESTIMATED FLOW: STREET FLOW DEPTH (FEET) = 0.94HALFSTREET FLOOD WIDTH (FEET) = 52.85 AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.80 PRODUCT OF DEPTH&VELOCITY(FT\*FT/SEC.) = 1.70\*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS, AND L = 1347.9 FT WITH ELEVATION-DROP = 2.5 FT, IS 89.1 CFS, WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE 21068.00 \*\* PEAK FLOW RATE TABLE \*\* STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 199.96 22.86 1.427 0.92(0.22) 0.24 184.2 21050.00 2 148.54 41.07 1.004 0.92(0.23) 0.24 211.9 21060.00 NEW PEAK FLOW DATA ARE: PEAK FLOW RATE (CFS) = 199.96 Tc (MIN.) = 22.86 AREA-AVERAGED Fm(INCH/HR) = 0.22 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.24 EFFECTIVE AREA(ACRES) = 184.24 LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21068.00 = 5875.96 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21068.00 TO NODE 21069.00 IS CODE = 33 \_\_\_\_\_ >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << \_\_\_\_\_\_ UPSTREAM NODE ELEVATION (FEET) = 1217.50 DOWNSTREAM NODE ELEVATION (FEET) = 1215.00 FLOW LENGTH (FEET) = 1146.78 MANNING'S N = 0.013USER SPECIFIED PIPE DIAMETER (INCH) = 93.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 93.0 INCH PIPE IS 47.1 INCHES PIPE-FLOW VELOCITY (FEET/SEC.) = 8.34 Date: 04/21/2014 File name: LR0210ZZ.RES Page 40

В

41.62 0.75 0.100 56

```
PIPE-FLOW(CFS) = 199.96
                                                                               NUMBER
                                                                                        (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                          (ACRES)
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                        224.10 25.30 1.343 0.92(0.20) 0.22 218.6 21050.00
 PIPEFLOW TRAVEL TIME (MIN.) = 2.44 Tc (MIN.) = 25.30
                                                                                       168.04 43.69 0.968 0.92(0.21) 0.23 246.2 21060.00
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.343
                                                                               LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
 SUBAREA LOSS RATE DATA (AMC II):
                                                                              ** MEMORY BANK # 1 CONFLUENCE DATA **
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               PEAK FLOW RATE (CFS) = 3461.47 Tc (MIN.) = 60.20
 RESIDENTIAL
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.51 Ybar = 0.59
 "3-4 DWELLINGS/ACRE"
                    B
                             1.21
                                       0.75
                                               0.600 56
                                                                              TOTAL AREA(ACRES) = 10647.2
                              33.09
                                       0.98
                                               0.100
 COMMERCIAL
                       A
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 PUBLIC PARK
                       В
                              0.04
                                       0.75
                                               0.850 56
                                                                              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.118
                                                                              UNIT-HYDROGRAPH DATA:
                             SUBAREA RUNOFF(CFS) = 38.09
                                                                              RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.03;24H= 4.15
 SUBAREA AREA(ACRES) = 34.34
 EFFECTIVE AREA(ACRES) = 218.58 AREA-AVERAGED Fm(INCH/HR) = 0.24
                                                                              S-GRAPH: VALLEY (DEV.) = 71.4%; VALLEY (UNDEV.) / DESERT= 28.6%
 AREA-AVERAGED Fp(INCH/HR) = 0.92 AREA-AVERAGED Ap = 0.26
                                                                                     MOUNTAIN= 0.0\%; FOOTHILL= 0.0\%; DESERT (UNDEV.) = 0.0\%
 TOTAL AREA (ACRES) = 246.2 PEAK FLOW RATE (CFS) = 217.84
                                                                              Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.50; Ybar = 0.59
                                                                              USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.66; 1HR = 0.67;
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
                                                                              3HR = 0.94; 6HR = 0.97; 24HR = 0.98
                                                                              UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 10893.4
 STREET CROSS-SECTION INFORMATION:
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21069.00 = 45066.88 FEET.
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
                                                                               EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
                                                                               Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239; Lca/L=0.6,n=.0223
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                              TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 1598.78
                                                                              PEAK FLOW RATE (CFS) = 3521.80
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                             ******************
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                              FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 12
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                              >>>>CLEAR MEMORY BANK # 1 <<<<
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
                                                                             ______
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 17.89
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                             *****************
  STREET FLOW DEPTH (FEET) = 0.64
                                                                              FLOW PROCESS FROM NODE 21069.00 TO NODE 21070.00 IS CODE = 54
  HALFSTREET FLOOD WIDTH (FEET) = 24.04
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.50
                                                                              >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.96
                                                                              >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                             _____
 ** PEAK FLOW RATE TABLE **
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1215.00 DOWNSTREAM(FEET) = 1183.00
         Q Tc Intensity Fp(Fm) Ap Ae
                                                     HEADWATER
                                                                              CHANNEL LENGTH THRU SUBAREA (FEET) = 2795.47 CHANNEL SLOPE = 0.0114
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                              CHANNEL BASE (FEET) = 18.00 "Z" FACTOR = 2.000
          224.10 25.30 1.343 0.92(0.20) 0.22 218.6 21050.00
    1
                                                                              MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 9.00
    2
         168.04 43.69 0.968 0.92(0.21) 0.23
                                               246.2 21060.00
                                                                              CHANNEL FLOW THRU SUBAREA(CFS) = 3521.80
                                                                              FLOW VELOCITY (FEET/SEC.) = 24.53 FLOW DEPTH (FEET) = 5.09
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 224.10 Tc (MIN.) = 25.30
                                                                              TRAVEL TIME (MIN.) = 1.90 Tc (MIN.) = 62.10
 AREA-AVERAGED Fm(INCH/HR) = 0.20 AREA-AVERAGED Fp(INCH/HR) = 0.92
                                                                              LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
 AREA-AVERAGED Ap = 0.22 EFFECTIVE AREA(ACRES) = 218.58
                                                                             LONGEST FLOWPATH FROM NODE 21060.00 TO NODE 21069.00 = 7022.74 FEET.
                                                                               FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 21069.00 TO NODE 21069.00 IS CODE = 11
                                                                               >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
.....
                                                                             ______
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
                                                                              MAINLINE Tc (MIN.) = 62.10
_____
                                                                               * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 0.784
                                                                              SUBAREA LOSS RATE DATA (AMC II):
 ** MAIN STREAM CONFLUENCE DATA **
                                                                               DEVELOPMENT TYPE/
                                                                                                  SCS SOIL AREA
                                                                                                                    Fρ
                                                                                                                            Αp
  STREAM
            Q Tc Intensity Fp(Fm)
                                       Ap Ae
                                                     HEADWATER
                                                                                  LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
       Date: 04/21/2014
                      File name: LR0210ZZ.RES
                                                     Page 41
```

NODE

SCS

```
COMMERCIAL
                      B 108.13 0.75 0.100 56
 RESIDENTIAL
                   В 17.27
 "3-4 DWELLINGS/ACRE"
                                     0.75 0.600 56
 PUBLIC PARK
                      В
                            5.11
                                     0.75
                                             0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196
 SUBAREA AREA (ACRES) = 130.51
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.03;24H= 4.14
 S-GRAPH: VALLEY (DEV.) = 71.7%; VALLEY (UNDEV.) / DESERT = 28.3%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.50; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234; Lca/L=0.6,n=.0218
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 1628.62
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3467.80
 TOTAL AREA (ACRES) = 11023.9
                            PEAK FLOW RATE (CFS) = 3521.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21070.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 11023.9 TC(MIN.) =
 AREA-AVERAGED Fm (INCH/HR) = 0.50 Ybar = 0.58
 PEAK FLOW RATE (CFS) = 3521.80
_____
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0210ZZ.RES Page 43 Date: 04/21/2014 File name: LR0210ZZ.RES Page 44

\*\*\*\*\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21167

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

FILE NAME: LR0211ZZ.DAT

TIME/DATE OF STUDY: 08:02 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING
WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT-/PARK- SIDE / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
===	=====	=======	=======================================	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 10.0 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21100.00 TO NODE 21101.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 678.31 ELEVATION DATA: UPSTREAM(FEET) = 1870.00 DOWNSTREAM(FEET) = 1820.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.418 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.430 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр αA SCS Tc GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE RESIDENTIAL "3-4 DWELLINGS/ACRE" 0.91 0.75 0.600 56 9.42 RESIDENTIAL "2 DWELLINGS/ACRE" В 6.56 0.75 0.700 56 10.01 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688 SUBAREA RUNOFF(CFS) = 12.88 7.47 PEAK FLOW RATE(CFS) = TOTAL AREA (ACRES) = 12.88 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.31; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21101.00 TO NODE 21102.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1820.00 DOWNSTREAM(FEET) = 1770.00

CHANNEL LENGTH THRU SUBAREA (FEET) = 733.55 CHANNEL SLOPE = 0.0682

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000

Date: 04/21/2014 File name: LR0211ZZ.RES Page 1 Date: 04/21/2014 File name: LR0211ZZ.RES Page 2

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 4.46 FLOW DEPTH (FEET) = 0.76
 TRAVEL TIME (MIN.) = 2.74 Tc (MIN.) = 12.16
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21102.00 = 1411.86 FEET.
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21102.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 12.16
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.085
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                           Ар
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 10.44
                                 0.75
                                          0.700
                                                56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.19
                                 0.75
                                          0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA(ACRES) = 12.63
                           SUBAREA RUNOFF (CFS) = 17.89
 EFFECTIVE AREA(ACRES) = 20.10 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 20.1
                          PEAK FLOW RATE(CFS) =
                                                 28.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21102.00 TO NODE 21103.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1770.00 DOWNSTREAM(FEET) = 1750.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 514.94 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 28.45
 FLOW VELOCITY (FEET/SEC.) = 4.42 FLOW DEPTH (FEET) = 1.13
 TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 14.10
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21103.00 = 1926.80 FEET.
********************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21103.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 14.10
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.907
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fp
                                           Ар
                                                SCS
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                          1.23
                                   0.75
                                          0.600
                                               56
 RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"
                          8.43 0.75 0.700 56
                    В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
                         SUBAREA RUNOFF(CFS) = 12.11
 SUBAREA AREA(ACRES) = 9.66
 EFFECTIVE AREA(ACRES) = 29.76 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 29.8
                             PEAK FLOW RATE (CFS) = 37.36
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21103.00 TO NODE 21104.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1715.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 660.67 CHANNEL SLOPE = 0.0530
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 37.36
 FLOW VELOCITY (FEET/SEC.) = 5.30 FLOW DEPTH (FEET) = 1.19
 TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 16.18
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21104.00 = 2587.47 FEET.
*************************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21104.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 16.18
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.756
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                         Aр
                                                 SCS
    LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   в 20.18
                                    0.75
                                           0.700
                                                  56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 4.62
                                           0.600
                                                  56
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.681
 SUBAREA AREA(ACRES) = 24.80 SUBAREA RUNOFF(CFS) = 27.83
 EFFECTIVE AREA(ACRES) = 54.56 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 54.6 PEAK FLOW RATE (CFS) =
                                                  61.14
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21104.00 TO NODE 21105.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1715.00 DOWNSTREAM ELEVATION(FEET) = 1705.00
 STREET LENGTH (FEET) = 402.43 CURB HEIGHT (INCHES) = 8.0
```

Page 4

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     64.08
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.64
   HALFSTREET FLOOD WIDTH (FEET) = 24.27
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.39
 STREET FLOW TRAVEL TIME (MIN.) = 1.78 Tc (MIN.) = 19.27
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.582
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
                                                         SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.35 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.77 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA(ACRES) = 6.12 SUBAREA RUNOFF(CFS) = 5.88
 EFFECTIVE AREA(ACRES) = 64.31 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 64.3 PEAK FLOW RATE (CFS) = 61.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 23.98
 FLOW VELOCITY (FEET/SEC.) = 5.21 DEPTH*VELOCITY (FT*FT/SEC.) = 3.33
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21106.00 = 3552.21 FEET.
******************
 FLOW PROCESS FROM NODE 21106.00 TO NODE 21107.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1690.00 DOWNSTREAM ELEVATION(FEET) = 1670.00
 STREET LENGTH (FEET) = 483.05 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     65.27
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
```

Page 6

Date: 04/21/2014 File name: LR0211ZZ.RES Page 5

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
HALFSTREET FLOOD WIDTH (FEET) = 22.46
                                                                                   RESIDENTIAL.
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.24
                                                                                   "2 DWELLINGS/ACRE"
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.79
                                                                                   RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 20.56
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.521
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                 Αp
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                      B 6.11 0.75
                                                 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.21 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
 SUBAREA AREA (ACRES) = 7.32 SUBAREA RUNOFF (CFS) = 6.65
 EFFECTIVE AREA(ACRES) = 71.63 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 71.6 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 22.46
 FLOW VELOCITY (FEET/SEC.) = 6.22 DEPTH*VELOCITY (FT*FT/SEC.) = 3.78
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21107.00 = 4035.26 FEET.
******************
 FLOW PROCESS FROM NODE 21107.00 TO NODE 21108.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1670.00 DOWNSTREAM ELEVATION(FEET) = 1640.00
 STREET LENGTH (FEET) = 579.31 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.74
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 79.67
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.62
  HALFSTREET FLOOD WIDTH (FEET) = 23.22
                                                                                       LAND USE
                                                                                   RESIDENTIAL
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.14
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.44
 STREET FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 21.91
                                                                                   RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.464
 SUBAREA LOSS RATE DATA (AMC II):
                                               Ар
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

```
B 28.69
                                        0.75
                                                0.700
 "3-4 DWELLINGS/ACRE"
                      В
                             5.30 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 33.99 SUBAREA RUNOFF (CFS) = 29.13
 EFFECTIVE AREA(ACRES) = 105.62 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 105.6 PEAK FLOW RATE (CFS) =
                                                         90.56
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.65 HALFSTREET FLOOD WIDTH (FEET) = 24.45
 FLOW VELOCITY (FEET/SEC.) = 7.34 DEPTH*VELOCITY (FT*FT/SEC.) = 4.75
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21108.00 = 4614.57 FEET.
******************
 FLOW PROCESS FROM NODE 21108.00 TO NODE 21109.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 1132.55 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.80
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   99.59
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.70
   HALFSTREET FLOOD WIDTH (FEET) = 27.64
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.62
 STREET FLOW TRAVEL TIME (MIN.) = 2.86 Tc (MIN.) = 24.77
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.360
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                       SCS
                                        Fρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "2 DWELLINGS/ACRE"
                      B 21.44 0.75
                                                0.700
                                                        56
 "3-4 DWELLINGS/ACRE"
                      В 2.32
                                        0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA(ACRES) = 23.76
                               SUBAREA RUNOFF(CFS) = 18.05
```

Page 8

```
EFFECTIVE AREA(ACRES) = 129.38 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 129.4 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70 HALFSTREET FLOOD WIDTH(FEET) = 27.52
 FLOW VELOCITY (FEET/SEC.) = 6.61 DEPTH*VELOCITY (FT*FT/SEC.) = 4.61
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21109.00 = 5747.12 FEET.
*****
 FLOW PROCESS FROM NODE 21109.00 TO NODE 21110.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1550.00
 STREET LENGTH (FEET) = 761.67 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 101.58
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.65
   HALFSTREET FLOOD WIDTH (FEET) = 24.39
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.35
 STREET FLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 26.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.312
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                 Дp
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                 0.700
 "2 DWELLINGS/ACRE" B 6.59
                                         0.75
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.29
                                         0.75
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA(ACRES) = 7.88 SUBAREA RUNOFF(CFS) = 5.68
 EFFECTIVE AREA(ACRES) = 137.26 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 137.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
DEPTH(FEET) = 0.64 HALFSTREET FLOOD WIDTH(FEET) = 24.15
 FLOW VELOCITY (FEET/SEC.) = 8.20 DEPTH*VELOCITY (FT*FT/SEC.) = 5.26
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21110.00 = 6508.79 FEET.
******************
 FLOW PROCESS FROM NODE 21110.00 TO NODE 21129.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1550.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1495.00
 FLOW LENGTH (FEET) = 1519.57 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 20.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 19.99
 PIPE-FLOW(CFS) =
                 98.81
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.27 Tc (MIN.) = 27.57
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE TC(MIN.) = 27.57
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.276
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                 SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           21.30 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 21.30
                         SUBAREA RUNOFF(CFS) = 15.85
 EFFECTIVE AREA(ACRES) = 158.56 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 158.6
                             PEAK FLOW RATE (CFS) = 110.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
 FLOW PROCESS FROM NODE 21121.00 TO NODE 21122.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 969.86
 ELEVATION DATA: UPSTREAM(FEET) = 1830.00 DOWNSTREAM(FEET) = 1770.00
```

Page 10

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.254
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.184
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.27
                                        0.75
                                                0.600
                                                      56 11.25
 RESIDENTIAL
                      B 5.70 0.75 0.700 56 11.96
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA RUNOFF(CFS) = 10.50
 TOTAL AREA (ACRES) = 6.97 PEAK FLOW RATE (CFS) = 10.50
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.32: 6HR = 1.81: 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21122.00 TO NODE 21123.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1770.00 DOWNSTREAM ELEVATION(FEET) = 1700.00
 STREET LENGTH (FEET) = 1318.97 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 17.12
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.88
 STREET FLOW TRAVEL TIME (MIN.) = 4.46 Tc (MIN.) = 15.72
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.787
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.67
                                        0.75
                                                0.600
 RESIDENTIAL
                      B 10.86 0.75 0.700 56
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.694
 SUBAREA AREA (ACRES) = 11.53 SUBAREA RUNOFF (CFS) = 13.16
 EFFECTIVE AREA(ACRES) = 18.50 AREA-AVERAGED Fm(INCH/HR) = 0.52
```

```
TOTAL AREA (ACRES) =
                    18.5 PEAK FLOW RATE (CFS) =
                                                         21.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.40 HALFSTREET FLOOD WIDTH(FEET) = 13.90
 FLOW VELOCITY (FEET/SEC.) = 5.16 DEPTH*VELOCITY (FT*FT/SEC.) = 2.09
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21123.00 = 2288.83 FEET.
******************
 FLOW PROCESS FROM NODE 21123.00 TO NODE 21124.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1700.00 DOWNSTREAM ELEVATION(FEET) = 1625.00
 STREET LENGTH (FEET) = 1863.96 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   35.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.49
   HALFSTREET FLOOD WIDTH (FEET) = 18.00
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.60
 STREET FLOW TRAVEL TIME (MIN.) = 5.82 Tc (MIN.) = 21.54
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.479
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               Дp
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.04
                                        0.75
                                                0.600
                                                        56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      в 29.70 0.75
                                                0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA (ACRES) = 33.74 SUBAREA RUNOFF (CFS) = 29.29
 EFFECTIVE AREA(ACRES) = 52.24 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 52.2 PEAK FLOW RATE (CFS) =
                                                         45.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

File name: LR0211ZZ.RES

Page 12

Date: 04/21/2014

AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69

```
DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.74
                                                                                    >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 5.84 DEPTH*VELOCITY (FT*FT/SEC.) = 3.01
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21124.00 = 4152.79 FEET.
************************
                                                                                    STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21124.00 TO NODE 21125.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1625.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 472.91 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      ***STREET FLOWING FULL***
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                      STREET FLOW DEPTH (FEET) = 0.53
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    SUBAREA LOSS RATE DATA (AMC II):
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.88
                                                                                        LAND USE
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.13
                                                                                    RESIDENTIAL
                                                                                    "2 DWELLINGS/ACRE"
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.45
 STREET FLOW TRAVEL TIME (MIN.) = 1.11 Tc (MIN.) = 22.64
                                                                                    RESIDENTIAL
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.436
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                         SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.00
                                       0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.67 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA(ACRES) = 4.67 SUBAREA RUNOFF(CFS) = 3.88
 EFFECTIVE AREA(ACRES) = 56.91 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 56.9 PEAK FLOW RATE (CFS) =
                                                        47.16
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.48 HALFSTREET FLOOD WIDTH (FEET) = 17.80
 FLOW VELOCITY (FEET/SEC.) = 7.17 DEPTH*VELOCITY (FT*FT/SEC.) = 3.46
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21125.00 = 4625.70 FEET.
                                                                                    TOTAL NUMBER OF STREAMS = 2
FLOW PROCESS FROM NODE 21125.00 TO NODE 21126.00 IS CODE = 63
                                                                                    AREA-AVERAGED Fm(INCH/HR) = 0.51
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

```
UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH (FEET) = 502.51 CURB HEIGHT (INCHES) = 6.0
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   HALFSTREET FLOOD WIDTH (FEET) = 19.35
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.17
 STREET FLOW TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 24.03
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.385
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  Дp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                      B 4.19 0.75 0.700
                                                          56
 "3-4 DWELLINGS/ACRE" B 1.64 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.672
 SUBAREA AREA (ACRES) = 5.83 SUBAREA RUNOFF (CFS) = 4.63
 EFFECTIVE AREA(ACRES) = 62.74 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA(ACRES) = 62.7 PEAK FLOW RATE(CFS) = 49.20
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.53 HALFSTREET FLOOD WIDTH(FEET) = 19.35
 FLOW VELOCITY (FEET/SEC.) = 5.98 DEPTH*VELOCITY (FT*FT/SEC.) = 3.15
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.
******************
 FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
______
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 24.03
 RAINFALL INTENSITY (INCH/HR) = 1.39
 AREA-AVERAGED Fp (INCH/HR) = 0.75
       Date: 04/21/2014 File name: LR0211ZZ.RES
                                                        Page 14
```

```
AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 62.74
 TOTAL STREAM AREA(ACRES) = 62.74
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                49.20
********************
 FLOW PROCESS FROM NODE 21150.00 TO NODE 21151.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH(FEET) = 912.75
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1685.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 14.318
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.890
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS Tc
                                               aρ
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                            6.53
                                       0.75
                                              0.700
                                                    56 15.22
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.32
                                      0.75
                                            0.600 56 14.32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.695
 SUBAREA RUNOFF (CFS) = 8.44
 TOTAL AREA (ACRES) = 6.85 PEAK FLOW RATE (CFS) =
                                              8.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21151.00 TO NODE 21152.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1685.00 DOWNSTREAM ELEVATION (FEET) = 1630.00
 STREET LENGTH (FEET) = 659.39 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.59
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.36
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.35
   HALFSTREET FLOOD WIDTH (FEET) = 11.09
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.98
```

```
STREET FLOW TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 16.25
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.752
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                       SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 10.34 0.75 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.04 0.75
                                               0.600
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 12.38 SUBAREA RUNOFF (CFS) = 13.82
 EFFECTIVE AREA(ACRES) = 19.23 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 19.2 PEAK FLOW RATE (CFS) =
                                                        21.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.38 HALFSTREET FLOOD WIDTH (FEET) = 12.73
 FLOW VELOCITY (FEET/SEC.) = 6.16 DEPTH*VELOCITY (FT*FT/SEC.) = 2.35
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21152.00 = 1572.14 FEET.
******************
 FLOW PROCESS FROM NODE 21152.00 TO NODE 21153.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 730.95 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.21
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.43
  HALFSTREET FLOOD WIDTH (FEET) = 15.23
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.58
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.40
 STREET FLOW TRAVEL TIME (MIN.) = 2.18 Tc (MIN.) = 18.43
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.624
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 6.40 0.75
                                               0.700
                                                      56
 RESIDENTIAL
```

File name: LR0211ZZ.RES

Page 16

Date: 04/21/2014

```
"3-4 DWELLINGS/ACRE" B 1.41 0.75 0.600 56
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.72
                                                                             TOTAL AREA (ACRES) =
                                                                                               39.7 PEAK FLOW RATE (CFS) =
 NATURAL FAIR COVER
                              4.11 0.61 1.000 66
 "OPEN BRUSH"
                       В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.792
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 SUBAREA AREA (ACRES) = 11.92 SUBAREA RUNOFF (CFS) = 11.57
 EFFECTIVE AREA(ACRES) = 31.15 AREA-AVERAGED Fm(INCH/HR) = 0.53
                                                                             END OF SUBAREA STREET FLOW HYDRAULICS:
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.73
                                                                             DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.56
 TOTAL AREA (ACRES) = 31.1 PEAK FLOW RATE (CFS) =
                                                      30.78
                                                                             FLOW VELOCITY (FEET/SEC.) = 4.51 DEPTH*VELOCITY (FT*FT/SEC.) = 2.30
                                                                             LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21126.00 = 3110.66 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                            ******************
                                                                             FLOW PROCESS FROM NODE 21126.00 TO NODE 21126.00 IS CODE = 1
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                            ______
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.01
                                                                             >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 FLOW VELOCITY (FEET/SEC.) = 5.74 DEPTH*VELOCITY (FT*FT/SEC.) = 2.56
                                                                            >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 LONGEST FLOWPATH FROM NODE 21150.00 TO NODE 21153.00 = 2303.09 FEET.
                                                                            TOTAL NUMBER OF STREAMS = 2
******************
                                                                             CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 21153.00 TO NODE 21126.00 IS CODE = 63
                                                                             TIME OF CONCENTRATION (MIN.) = 21.40
                                                                             RAINFALL INTENSITY (INCH/HR) = 1.49
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             AREA-AVERAGED Fm(INCH/HR) = 0.52
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.73
______
                                                                             AREA-AVERAGED Ap = 0.72
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1570.00
                                                                             EFFECTIVE STREAM AREA(ACRES) = 39.67
 STREET LENGTH (FEET) = 807.57 CURB HEIGHT (INCHES) = 6.0
                                                                             TOTAL STREAM AREA(ACRES) = 39.67
 STREET HALFWIDTH (FEET) = 18.00
                                                                             PEAK FLOW RATE (CFS) AT CONFLUENCE = 34.35
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                             ** CONFLUENCE DATA **
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                               1
                                                                                       49.20 24.03 1.385 0.75 (0.51) 0.69 62.7 21121.00
                                                                                       34.35 21.40 1.485 0.73(0.52)0.72 39.7 21150.00
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             CONFLUENCE FORMULA USED FOR 2 STREAMS.
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                             ** PEAK FLOW RATE TABLE **
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 34.52
                                                                              STREAM
                                                                                     Q Tc Intensity Fp(Fm)
                                                                                                                   Ap Ae
   ***STREET FLOWING FULL***
                                                                              NUMBER
                                                                                       (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                              1
                                                                                       83.18 21.40 1.485 0.74(0.52)0.70 95.5 21150.00
                                                                                       79.98 24.03 1.385 0.74(0.52) 0.70 102.4 21121.00
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 18.56
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.53
                                                                             COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             PEAK FLOW RATE (CFS) = 83.18 Tc (MIN.) = 21.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.31
                                                                             EFFECTIVE AREA(ACRES) = 95.53 AREA-AVERAGED Fm(INCH/HR) = 0.52
 STREET FLOW TRAVEL TIME (MIN.) = 2.97 Tc (MIN.) = 21.40
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.485
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             TOTAL AREA (ACRES) = 102.4
                                                                             LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21126.00 = 5128.21 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fр
                                               Aр
                                                     SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            ******************
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 7.02
                                                                             FLOW PROCESS FROM NODE 21126.00 TO NODE 21127.00 IS CODE = 63
                                      0.75
                                              0.700 56
 RESIDENTIAL
                                                                            ______
 "3-4 DWELLINGS/ACRE" B
                            1.50 0.75 0.600 56
                                                                             >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             >>>> (STREET TABLE SECTION # 5 USED) <<<<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
                                                                            ______
 SUBAREA AREA(ACRES) = 8.52 SUBAREA RUNOFF(CFS) = 7.47
                                                                             UPSTREAM ELEVATION (FEET) = 1570.00 DOWNSTREAM ELEVATION (FEET) = 1557.00
 EFFECTIVE AREA(ACRES) = 39.67 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                             STREET LENGTH (FEET) = 322.81 CURB HEIGHT (INCHES) = 6.0
```

Date: 04/21/2014 File name: LR0211ZZ.RES

HEADWATER

34.35

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.37
 STREET FLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 22.15
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.455
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Ар
                                                        SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.16
                                                 0.700
                                         0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.72 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA(ACRES) = 2.88 SUBAREA RUNOFF(CFS) = 2.46
 EFFECTIVE AREA(ACRES) = 98.41 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 105.3 PEAK FLOW RATE (CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.38
 FLOW VELOCITY (FEET/SEC.) = 7.13 DEPTH*VELOCITY (FT*FT/SEC.) = 4.33
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21127.00 = 5451.02 FEET.
******************
 FLOW PROCESS FROM NODE 21127.00 TO NODE 21128.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1557.00 DOWNSTREAM(FEET) = 1535.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 354.44 CHANNEL SLOPE = 0.0621
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                83.18
 FLOW VELOCITY (FEET/SEC.) = 9.29 FLOW DEPTH (FEET) = 1.09
 TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 22.79
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21128.00 = 5805.46 FEET.
```

```
*************************
 FLOW PROCESS FROM NODE 21128.00 TO NODE 21128.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 22.79
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.430
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 10.17
                                    0.75 0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 45.95 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 56.12 SUBAREA RUNOFF (CFS) = 46.47
 EFFECTIVE AREA(ACRES) = 154.53 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 161.4 PEAK FLOW RATE (CFS) = 127.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
***********************
 FLOW PROCESS FROM NODE 21128.00 TO NODE 21129.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1535.00 DOWNSTREAM(FEET) = 1495.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1036.57 CHANNEL SLOPE = 0.0386
 CHANNEL BASE (FEET) = 6.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 3.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 127.33
 FLOW VELOCITY (FEET/SEC.) = 8.90 FLOW DEPTH (FEET) = 1.57
 TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 24.73
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc (MIN.) = 24.73
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.362
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                         Аp
   LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 17.92 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 17.92 SUBAREA RUNOFF(CFS) = 14.72
 EFFECTIVE AREA(ACRES) = 172.45 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 179.3 PEAK FLOW RATE(CFS) =
                                               132.52
```

File name: LR0211ZZ.RES

Page 20

Date: 04/21/2014

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
_____
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM
          0
              Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
         132.52 24.73 1.362 0.74(0.51) 0.68 172.5 21150.00
   1
    2
         124.60 27.41 1.280 0.74(0.51) 0.68 179.3 21121.00
 LONGEST FLOWPATH FROM NODE 21121.00 TO NODE 21129.00 = 6842.03 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
         0
               Tc Intensity Fp(Fm) Ap Ae
                                                 HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
   1
         110.15 27.57 1.276 0.75(0.50) 0.67 158.6 21100.00
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
         242.34 24.73 1.362 0.75(0.51) 0.68 314.7 21150.00
   1
         234.75 27.41 1.280 0.75(0.51) 0.68 337.0 21121.00
         234.06 27.57 1.276 0.75(0.51) 0.68 337.9 21100.00
    3
  TOTAL AREA(ACRES) =
                      337.9
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 242.34 Tc (MIN.) = 24.729
 EFFECTIVE AREA(ACRES) = 314.69 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 337.9
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21129.00 = 8028.36 FEET.
*******************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21129.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<
______
*****************
 FLOW PROCESS FROM NODE 21129.00 TO NODE 21130.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1495.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 FLOW LENGTH (FEET) = 1595.06 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 72.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 72.0 INCH PIPE IS 31.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.76
 PIPE-FLOW(CFS) = 242.34
```

```
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 26.01
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21130.00 = 9623.42 FEET.
************************
 FLOW PROCESS FROM NODE 21130.00 TO NODE 21130.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc (MIN.) = 26.01
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.321
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 64.12 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 64.12 SUBAREA RUNOFF(CFS) = 50.33
 EFFECTIVE AREA(ACRES) = 378.81 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA(ACRES) = 402.0
                              PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
************************
 FLOW PROCESS FROM NODE 21130.00 TO NODE 21146.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1403.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1317.93 CHANNEL SLOPE = 0.0432
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              281.16
 FLOW VELOCITY (FEET/SEC.) = 11.30 FLOW DEPTH (FEET) = 2.06
 TRAVEL TIME (MIN.) = 1.94 Tc (MIN.) = 27.95
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET.
******************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 27.95
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.265
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                           αA
                                                   SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                            22.28
                                     0.75
                                            0.600
                                                    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      В
                             1.50
                                     0.63
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.625
 SUBAREA AREA (ACRES) = 23.78 SUBAREA RUNOFF (CFS) = 17.23
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 21 Date: 04/21/2014 File name: LR0211ZZ.RES Page 22

```
EFFECTIVE AREA(ACRES) = 402.59 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA(ACRES) = 425.8
                             PEAK FLOW RATE (CFS) = 281.16
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
********************
 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 27.95
 RAINFALL INTENSITY (INCH/HR) = 1.27
 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.66
 EFFECTIVE STREAM AREA(ACRES) = 402.59
 TOTAL STREAM AREA(ACRES) = 425.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 281.16
******************
 FLOW PROCESS FROM NODE 21140.00 TO NODE 21141.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
INITIAL SUBAREA FLOW-LENGTH (FEET) = 286.67
 ELEVATION DATA: UPSTREAM(FEET) = 1460.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.750
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.731
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                           Ap SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.17 0.75 0.600 56 7.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 4.46
 TOTAL AREA(ACRES) = 2.17 PEAK FLOW RATE(CFS) =
                                             4.46
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*****************
 FLOW PROCESS FROM NODE 21141.00 TO NODE 21142.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1445.00
 STREET LENGTH (FEET) = 752.60 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.41
   HALFSTREET FLOOD WIDTH (FEET) = 13.98
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 6.82 Tc (MIN.) = 14.57
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.870
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                          SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.85 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 4.85 SUBAREA RUNOFF (CFS) = 6.20
 EFFECTIVE AREA(ACRES) = 7.02 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 7.0 PEAK FLOW RATE (CFS) =
                                                            8.98
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.42 HALFSTREET FLOOD WIDTH(FEET) = 14.91
 FLOW VELOCITY (FEET/SEC.) = 1.92 DEPTH*VELOCITY (FT*FT/SEC.) = 0.81
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21142.00 = 1039.27 FEET.
*******************
 FLOW PROCESS FROM NODE 21142.00 TO NODE 21143.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1445.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 604.30 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.85
```

File name: LR0211ZZ.RES

Page 24

Date: 04/21/2014

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

```
**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.50
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.40
 STREET FLOW TRAVEL TIME (MIN.) = 2.88 Tc (MIN.) = 17.45
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.679
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   Ap SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.88 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 8.88 SUBAREA RUNOFF (CFS) = 9.83
 EFFECTIVE AREA(ACRES) = 15.90 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 15.9
                                 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43 HALFSTREET FLOOD WIDTH(FEET) = 14.99
 FLOW VELOCITY (FEET/SEC.) = 3.72 DEPTH*VELOCITY (FT*FT/SEC.) = 1.58
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21143.00 = 1643.57 FEET.
******************
 FLOW PROCESS FROM NODE 21143.00 TO NODE 21144.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1413.00
 STREET LENGTH (FEET) = 592.37 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.82
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.44
   HALFSTREET FLOOD WIDTH (FEET) = 15.54
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.78
 STREET FLOW TRAVEL TIME (MIN.) = 2.42 Tc (MIN.) = 19.87
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.553
 SUBAREA LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fp
                                                       SCS
                                                Αp
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             6.11 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.11 SUBAREA RUNOFF(CFS) = 6.07
 EFFECTIVE AREA (ACRES) = 22.01 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) = 21.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30: 30M = 0.61: 1HR = 0.80: 3HR = 1.32: 6HR = 1.81: 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.44 HALFSTREET FLOOD WIDTH (FEET) = 15.85
 FLOW VELOCITY (FEET/SEC.) = 4.16 DEPTH*VELOCITY (FT*FT/SEC.) = 1.84
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21144.00 = 2235.94 FEET.
******************
 FLOW PROCESS FROM NODE 21144.00 TO NODE 21145.00 IS CODE = 33
_______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1413.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1409.00
 FLOW LENGTH (FEET) = 90.21 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 9.1 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.21
 PIPE-FLOW(CFS) =
                   21.87
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.11 Tc (MIN.) = 19.98
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.547
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                                       SCS
                                                αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.65 0.75 0.600
                     B 1.61 0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.547
 SUBAREA AREA (ACRES) = 15.26 SUBAREA RUNOFF (CFS) = 15.63
 EFFECTIVE AREA(ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
 TOTAL AREA(ACRES) = 37.3 PEAK FLOW RATE(CFS) = 37.39
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 25

File name: LR0211ZZ.RES

Date: 04/21/2014

Page 26

```
MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                               *************************
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 FLOW PROCESS FROM NODE 21146.00 TO NODE 21146.00 IS CODE = 1
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
                                                                                >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 15.53
                                                                                >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES <<<<
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.38
                                                                                 TOTAL NUMBER OF STREAMS = 2
                                                                                 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
   HALFSTREET FLOOD WIDTH (FEET) = 12.65
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.52
                                                                                 TIME OF CONCENTRATION (MIN.) = 20.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.71
                                                                                 RAINFALL INTENSITY (INCH/HR) = 1.50
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21145.00 = 2326.15 FEET.
                                                                                 AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                                 AREA-AVERAGED Fp (INCH/HR) = 0.75
******************
                                                                                 AREA-AVERAGED Ap = 0.58
 FLOW PROCESS FROM NODE 21145.00 TO NODE 21146.00 IS CODE = 33
                                                                                 EFFECTIVE STREAM AREA(ACRES) = 37.27
______
                                                                                 TOTAL STREAM AREA(ACRES) = 37.27
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                                 PEAK FLOW RATE (CFS) AT CONFLUENCE = 37.39
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
                                                                                 ** CONFLUENCE DATA **
                                                                                            Q Tc Intensity Fp(Fm)
 UPSTREAM NODE ELEVATION (FEET) = 1409.00
                                                                                 STREAM
                                                                                                                        Ap Ae HEADWATER
 DOWNSTREAM NODE ELEVATION (FEET) = 1403.00
                                                                                 NUMBER
                                                                                           (CFS) (MIN.) (INCH/HR) (INCH/HR)
 FLOW LENGTH (FEET) = 538.70 MANNING'S N = 0.013
                                                                                  1
                                                                                          280.34 28.03 1.263 0.75(0.49) 0.66 402.6 21150.00
                                                                                          269.38 30.75 1.195 0.75(0.49) 0.66 424.9 21121.00
                                                                                   1
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
                                                                                   1
                                                                                          268.52 30.91 1.191 0.75(0.49) 0.66 425.8 21100.00
                                                                                          37.39 20.93 1.505 0.75(0.43) 0.58 37.3 21140.00
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 16.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 10.04
 PIPE-FLOW(CFS) = 37.39
                                                                                 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                 CONFLUENCE FORMULA USED FOR 2 STREAMS.
 PIPEFLOW TRAVEL TIME (MIN.) = 0.95 Tc (MIN.) = 20.93
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.505
                                                                                ** PEAK FLOW RATE TABLE **
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                 STREAM O To Intensity Fp(Fm) Ap Ae HEADWATER
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fр
                                                                                 NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                          312.59 20.93 1.505 0.75(0.49) 0.65 337.9 21140.00
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 1
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
                                                                                          309.30 28.03 1.263 0.75(0.49) 0.66
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
                                                                                   3
                                                                                          295.95 30.75 1.195 0.75(0.49) 0.66 462.2 21121.00
 SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
                                                                                          294.97 30.91 1.191 0.75(0.49) 0.66 463.1 21100.00
 EFFECTIVE AREA(ACRES) = 37.27 AREA-AVERAGED Fm(INCH/HR) = 0.43
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
                                                                                 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 TOTAL AREA (ACRES) = 37.3
                               PEAK FLOW RATE (CFS) = 37.39
                                                                                 PEAK FLOW RATE (CFS) = 312.59 Tc (MIN.) = 20.93
                                                                                 EFFECTIVE AREA(ACRES) = 337.87 AREA-AVERAGED Fm(INCH/HR) = 0.49
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
                                                                                 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                 TOTAL AREA (ACRES) = 463.1
                                                                                LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21146.00 = 10941.35 FEET.
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                               ******************
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0
                           STREET HALFWIDTH (FEET) = 32.00
                                                                                 FLOW PROCESS FROM NODE 21146.00 TO NODE 21165.00 IS CODE = 54
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                               _____
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
                                                                                 ELEVATION DATA: UPSTREAM(FEET) = 1403.00 DOWNSTREAM(FEET) = 1393.00
                                                                                 CHANNEL LENGTH THRU SUBAREA (FEET) = 424.11 CHANNEL SLOPE = 0.0236
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
                                                                                 CHANNEL FLOW THRU SUBAREA(CFS) = 312.59
                                                                                 FLOW VELOCITY (FEET/SEC.) = 9.35 FLOW DEPTH (FEET) = 2.55
 *NOTE: ESTIMATED PEAK FLOW DEFAULTED TO UPSTREAM PEAK FLOW;
       STREET HYDRAULICS NOT COMPUTED*
                                                                                 TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 21.69
 LONGEST FLOWPATH FROM NODE 21140.00 TO NODE 21146.00 = 2864.85 FEET.
                                                                                 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
```

Date: 04/21/2014

File name: LR0211ZZ.RES

Date: 04/21/2014 File name: LR0211ZZ.RES Page 28

(ACRES) NODE

439.9 21150.00

```
SUBAREA LOSS RATE DATA (AMC II):
******************
                                                                                        SCS SOIL AREA
                                                                        DEVELOPMENT TYPE/
                                                                                                         Fρ
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 10
                                                                           LAND USE
                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                       NATURAL FAIR COVER
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
                                                                       "OPEN BRUSH"
                                                                                                15.02
                                                                                                          0.61
_____
                                                                       RESIDENTIAL
                                                                                           B 4.09
                                                                                                          0.75
                                                                       "2 DWELLINGS/ACRE"
RESIDENTIAL
 FLOW PROCESS FROM NODE 21154.00 TO NODE 21154.20 IS CODE = 21
                                                                       "3-4 DWELLINGS/ACRE"
                                                                                          В 0.17
                                                                                                         0.75
...........
                                                                       SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
                                                                       SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                                                 SUBAREA RUNOFF(CFS) = 26.08
                                                                       SUBAREA AREA(ACRES) = 19.28
______
                                                                       EFFECTIVE AREA(ACRES) = 29.09 AREA-AVERAGED Fm(INCH/HR) = 0.59
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 709.46
                                                                       AREA-AVERAGED Fp(INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94
 ELEVATION DATA: UPSTREAM(FEET) = 1720.00 DOWNSTREAM(FEET) = 1680.00
                                                                       TOTAL AREA (ACRES) =
                                                                                       29.1
                                                                                                   PEAK FLOW RATE(CFS) =
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                       SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.117
                                                                       5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.328
                                                                      ******************
 SUBAREA TC AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                           Аp
                                                                       FLOW PROCESS FROM NODE 21154.40 TO NODE 21155.00 IS CODE = 54
                                   Fρ
                                                SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                      ______
 NATURAL FAIR COVER
                                                                       >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 "OPEN BRUSH"
                     В
                            8.73
                                   0.61
                                          1.000
                                                 66 17.34
                                                                       >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                      _____
 RESIDENTIAL
                            0.90
                                   0.75
                                          0.600
                                                 56 10.12
                                                                       ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
 "3-4 DWELLINGS/ACRE"
                     В
 RESIDENTIAL
                                                                       CHANNEL LENGTH THRU SUBAREA (FEET) = 874.03 CHANNEL SLOPE = 0.0458
 "2 DWELLINGS/ACRE"
                     В
                           0.18
                                   0.75
                                          0.700
                                                56 10.76
                                                                       CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
                                                                       MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.62
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.958
                                                                       CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                   39.32
                                                                       FLOW VELOCITY (FEET/SEC.) = 5.06 FLOW DEPTH (FEET) = 1.25
 SUBAREA RUNOFF (CFS) = 15.28
 TOTAL AREA(ACRES) = 9.81 PEAK FLOW RATE(CFS) = 15.28
                                                                       TRAVEL TIME (MIN.) = 2.88 Tc (MIN.) = 14.92
                                                                       LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21155.00 = 2198.21 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                      ******************
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                       FLOW PROCESS FROM NODE 21155.00 TO NODE 21155.00 IS CODE = 81
******************
 FLOW PROCESS FROM NODE 21154.20 TO NODE 21154.40 IS CODE = 54
                                                                       >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                     MAINLINE Tc(MIN.) = 14.92
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                       * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.844
______
                                                                       SUBAREA LOSS RATE DATA (AMC II):
 ELEVATION DATA: UPSTREAM(FEET) = 1680.00 DOWNSTREAM(FEET) = 1620.00
                                                                       DEVELOPMENT TYPE/
                                                                                      SCS SOIL AREA
                                                                                                         Fρ
 CHANNEL LENGTH THRU SUBAREA (FEET) = 614.72 CHANNEL SLOPE = 0.0976
                                                                          LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
                                                                       NATURAL FAIR COVER
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 3.00
                                                                                           В 17.09
                                                                                                          0.61
                                                                       "OPEN BRUSH"
 CHANNEL FLOW THRU SUBAREA(CFS) = 15.28
                                                                       RESIDENTIAL
 FLOW VELOCITY (FEET/SEC.) = 5.32 FLOW DEPTH (FEET) = 0.76
                                                                       "2 DWELLINGS/ACRE"
                                                                                                          0.75
                                                                                           В
                                                                                                4.24
 TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 12.04
                                                                       RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21154.40 = 1324.18 FEET.
                                                                       "3-4 DWELLINGS/ACRE"
                                                                                                0.47
                                                                                                         0.75
                                                                       SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.64
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.933
 FLOW PROCESS FROM NODE 21154.40 TO NODE 21154.40 IS CODE = 81
                                                                       SUBAREA AREA(ACRES) = 21.80
                                                                                                 SUBAREA RUNOFF (CFS) = 24.54
                                                                       EFFECTIVE AREA(ACRES) = 50.89 AREA-AVERAGED Fm(INCH/HR) = 0.59
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                       AREA-AVERAGED Fp (INCH/HR) = 0.63 AREA-AVERAGED Ap = 0.94
                                                                       TOTAL AREA(ACRES) = 50.9
______
                                                                                                   PEAK FLOW RATE(CFS) =
 MAINLINE Tc (MIN.) = 12.04
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.097
                                                                       SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014

File name: LR0211ZZ.RES

Date: 04/21/2014 File name: LR0211ZZ.RES Page 30

Αp

1.000

0.700

0.600

Αp

1.000

0.700

0.600

SCS

66

56

57.24

SCS

56

56

39.32

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                            STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                            Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
******************
                                                                            Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 FLOW PROCESS FROM NODE 21155.00 TO NODE 21156.00 IS CODE = 54
                                                                            MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.68
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                              ***STREET FLOWING FULL***
______
                                                                             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1545.00
                                                                             STREET FLOW DEPTH (FEET) = 0.61
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1194.85 CHANNEL SLOPE = 0.0293
                                                                             HALFSTREET FLOOD WIDTH (FEET) = 23.63
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
                                                                             AVERAGE FLOW VELOCITY (FEET/SEC.) = 8.54
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH(FEET) = 3.00
                                                                             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 5.23
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              57.24
                                                                            STREET FLOW TRAVEL TIME (MIN.) = 1.55 Tc (MIN.) = 20.70
 FLOW VELOCITY (FEET/SEC.) = 4.71 FLOW DEPTH (FEET) = 1.56
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.515
 TRAVEL TIME (MIN.) = 4.23 Tc (MIN.) = 19.15
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21156.00 = 3393.06 FEET.
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                              Fр
                                                                                LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
 FLOW PROCESS FROM NODE 21156.00 TO NODE 21156.00 IS CODE = 81
                                                                            "3-4 DWELLINGS/ACRE" B 10.24
                                                                                                                 0.75
______
                                                                            RESIDENTIAL
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                            "2 DWELLINGS/ACRE" B 5.14
                                                                                                                 0.75 0.700
_____
                                                                            SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MAINLINE Tc (MIN.) = 19.15
                                                                            SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.633
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.587
                                                                            SUBAREA AREA(ACRES) = 15.38
                                                                                                     SUBAREA RUNOFF (CFS) = 14.41
 SUBAREA LOSS RATE DATA (AMC II):
                                                                            EFFECTIVE AREA(ACRES) = 117.76 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                            AREA-AVERAGED Fp(INCH/HR) = 0.68 AREA-AVERAGED Ap = 0.81
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                              Ар
                                                    SCS
                                                                            TOTAL AREA (ACRES) = 117.8 PEAK FLOW RATE (CFS) =
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.30
                                      0.75
                                             0.600
                                                   56
                                                                            SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
                                                                            5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 "2 DWELLINGS/ACRE"
                      B
                             39.32
                                      0.75
                                             0.700
                                                    56
 NATURAL FAIR COVER
                                                                            END OF SUBAREA STREET FLOW HYDRAULICS:
                              7.87
 "OPEN BRUSH"
                       В
                                      0.61
                                           1.000
                                                                            DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.72
                                                                            FLOW VELOCITY (FEET/SEC.) = 8.55 DEPTH*VELOCITY (FT*FT/SEC.) = 5.24
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.738
                                                                            LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21157.00 = 4189.56 FEET.
 SUBAREA AREA(ACRES) = 51.49
                          SUBAREA RUNOFF (CFS) = 48.94
                                                                           ******************
 EFFECTIVE AREA(ACRES) = 102.38 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp (INCH/HR) = 0.67 AREA-AVERAGED Ap = 0.84
                                                                            FLOW PROCESS FROM NODE 21157.00 TO NODE 21163.00 IS CODE = 33
 TOTAL AREA(ACRES) = 102.4
                             PEAK FLOW RATE(CFS) =
                                                     94.45
                                                                          _______
                                                                            >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
                                                                          ______
                                                                            UPSTREAM NODE ELEVATION (FEET) = 1500.00
******************
                                                                            DOWNSTREAM NODE ELEVATION (FEET) = 1452.00
 FLOW PROCESS FROM NODE 21156.00 TO NODE 21157.00 IS CODE = 63
                                                                            FLOW LENGTH (FEET) = 1406.44 MANNING'S N = 0.013
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                            USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                            DEPTH OF FLOW IN 48.0 INCH PIPE IS 20.7 INCHES
_____
                                                                            PIPE-FLOW VELOCITY (FEET/SEC.) = 19.74
 UPSTREAM ELEVATION(FEET) = 1545.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
                                                                            PIPE-FLOW(CFS) = 102.17
 STREET LENGTH (FEET) = 796.50 CURB HEIGHT (INCHES) = 6.0
                                                                            *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 STREET HALFWIDTH (FEET) = 18.00
                                                                            PIPEFLOW TRAVEL TIME (MIN.) = 1.26 Tc (MIN.) = 21.97
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.462
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                            SUBAREA LOSS RATE DATA (AMC II):
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                              GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                LAND USE
                                                                            RESIDENTIAL
                                                                            "3-4 DWELLINGS/ACRE" B
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                                        19.67
                                                                                                                 0.75
```

Date: 04/21/2014

File name: LR0211ZZ.RES

Date: 04/21/2014 File name: LR0211ZZ.RES Page 32

101.65

Αp

0.600

αA

0.600

SCS

SCS

56

102.17

```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 19.67 SUBAREA RUNOFF (CFS) = 17.94
 EFFECTIVE AREA(ACRES) = 137.43 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp(INCH/HR) = 0.69 AREA-AVERAGED Ap = 0.78
 TOTAL AREA (ACRES) = 137.4 PEAK FLOW RATE (CFS) =
                                                     114.51
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 12.34
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.37
   HALFSTREET FLOOD WIDTH (FEET) = 12.18
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.42
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.97
 RAINFALL INTENSITY (INCH/HR) = 1.46
 AREA-AVERAGED Fm(INCH/HR) = 0.54
 AREA-AVERAGED Fp (INCH/HR) = 0.69
 AREA-AVERAGED Ap = 0.78
 EFFECTIVE STREAM AREA(ACRES) = 137.43
 TOTAL STREAM AREA (ACRES) = 137.43
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 114.51
********************
 FLOW PROCESS FROM NODE 21160.00 TO NODE 21161.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 381.26
 ELEVATION DATA: UPSTREAM(FEET) = 1545.00 DOWNSTREAM(FEET) = 1522.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.785
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.724
 SUBAREA TC AND LOSS RATE DATA (AMC II):
```

```
DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fр
                                                   SCS Tc
                                            Αp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           5.01 0.75 0.600 56 7.79
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 10.26
 TOTAL AREA(ACRES) = 5.01 PEAK FLOW RATE(CFS) = 10.26
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
************************
 FLOW PROCESS FROM NODE 21161.00 TO NODE 21162.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1522.00 DOWNSTREAM(FEET) = 1500.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 409.32 CHANNEL SLOPE = 0.0537
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            10.26
 FLOW VELOCITY (FEET/SEC.) = 4.91 FLOW DEPTH (FEET) = 0.43
 TRAVEL TIME (MIN.) = 1.39 Tc (MIN.) = 9.18
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21162.00 = 790.58 FEET.
******************
 FLOW PROCESS FROM NODE 21162.00 TO NODE 21162.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 9.18
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.468
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                            αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.71 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 4.71 SUBAREA RUNOFF(CFS) = 8.56
 EFFECTIVE AREA(ACRES) = 9.72 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 9.7 PEAK FLOW RATE(CFS) = 17.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21162.00 TO NODE 21163.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1500.00 DOWNSTREAM(FEET) = 1452.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1513.07 CHANNEL SLOPE = 0.0317
 CHANNEL BASE (FEET) = 4.00 "Z" FACTOR = 2.000
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 33 Date: 04/21/2014 File name: LR0211ZZ.RES Page 34

```
CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 4.88 FLOW DEPTH (FEET) = 0.68
                                                                        COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 TRAVEL TIME (MIN.) = 5.17 Tc (MIN.) = 14.34
                                                                        PEAK FLOW RATE (CFS) = 140.81 Tc (MIN.) = 14.34
 LONGEST FLOWPATH FROM NODE 21160.00 TO NODE 21163.00 = 2303.65 FEET.
                                                                        EFFECTIVE AREA(ACRES) = 114.15 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.74
******************
                                                                        TOTAL AREA (ACRES) = 161.8
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 81
                                                                        LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21163.00 = 5596.00 FEET.
_____
                                                                       *******************
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                        FLOW PROCESS FROM NODE 21163.00 TO NODE 21164.00 IS CODE = 42
 MAINLINE Tc (MIN.) = 14.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.888
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fр
                                          Ар
                                                                       ______
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1452.00
 RESIDENTIAL
                                                                        DOWNSTREAM NODE ELEVATION (FEET) = 1436.00
 "3-4 DWELLINGS/ACRE" B 14.70 0.75 0.600 56
                                                                        FLOW LENGTH (FEET) = 667.61 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                        USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 SUBAREA AREA (ACRES) = 14.70 SUBAREA RUNOFF (CFS) = 19.04
                                                                        DEPTH OF FLOW IN 54.0 INCH PIPE IS 25.8 INCHES
 EFFECTIVE AREA(ACRES) = 24.42 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                        PIPE-FLOW VELOCITY (FEET/SEC.) = 18.77
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                        PIPE-FLOW(CFS) = 140.81
 TOTAL AREA (ACRES) = 24.4 PEAK FLOW RATE (CFS) = 31.63
                                                                        *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 14.93
                                                                        LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21164.00 = 6263.61 FEET.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                       ******************
******************
                                                                        FLOW PROCESS FROM NODE 21164.00 TO NODE 21164.00 IS CODE = 81
 FLOW PROCESS FROM NODE 21163.00 TO NODE 21163.00 IS CODE = 1
______
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                       ______
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                        MAINLINE Tc(MIN.) = 14.93
______
                                                                        * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.843
 TOTAL NUMBER OF STREAMS = 2
                                                                        SUBAREA LOSS RATE DATA (AMC II):
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                         Fρ
                                                                                                                   αA
                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 TIME OF CONCENTRATION (MIN.) = 14.34
                                                                            LAND USE
 RAINFALL INTENSITY (INCH/HR) = 1.89
                                                                        RESIDENTIAL
                                                                        "3-4 DWELLINGS/ACRE"
 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                                                13.33
                                                                                                            0.75
                                                                                                                  0.600
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                        AGRICULTURAL FAIR COVER
 AREA-AVERAGED Ap = 0.60
                                                                        "ORCHARDS"
                                                                                             В
                                                                                                  1.74 0.63 1.000
 EFFECTIVE STREAM AREA(ACRES) = 24.42
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
 TOTAL STREAM AREA(ACRES) = 24.42
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.646
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 31.63
                                                                        SUBAREA AREA(ACRES) = 15.07
                                                                                                   SUBAREA RUNOFF(CFS) = 18.62
                                                                        EFFECTIVE AREA(ACRES) = 129.22 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                        AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.73
 ** CONFLUENCE DATA **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                        TOTAL AREA (ACRES) = 176.9
                                                                                                    PEAK FLOW RATE(CFS) =
  NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
         114.51 21.97 1.462 0.69(0.54)0.78 137.4 21154.00
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
         31.63 14.34 1.888 0.75(0.45) 0.60 24.4 21160.00
                                                                        5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                       *****************
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                         FLOW PROCESS FROM NODE 21164.00 TO NODE 21165.00 IS CODE = 42
                                                                       ______
 ** PEAK FLOW RATE TABLE **
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
  STREAM
               Tc Intensity Fp(Fm) Ap Ae
                                                 HEADWATER
                                                                        >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                       _____
         140.81 14.34 1.888 0.70(0.52) 0.74 114.1 21160.00
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1436.00
```

MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 2.00

Date: 04/21/2014 File name: LR0211ZZ.RES

Date: 04/21/2014 File name: LR0211ZZ.RES Page 36

56

154.78

2 136.78 21.97 1.462 0.69(0.52) 0.75 161.8 21154.00

```
DOWNSTREAM NODE ELEVATION (FEET) = 1393.00
                                                                           NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                   (ACRES)
 FLOW LENGTH (FEET) = 1236.24 MANNING'S N = 0.013
                                                                                   460.32 15.96 1.771 0.73 (0.49) 0.68
                                                                                                                        390.1 21160.00
                                                                                                                        515.0 21140.00
                                                                                   465.90 21.69
                                                                                                1.473 0.73(0.50) 0.68
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
                                                                                   462.49 23.61
                                                                                                1.400 0.73(0.50) 0.68
                                                                                                                       554.5 21154.00
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 24.5 INCHES
                                                                                   433.33 28.79
                                                                                                1.243 0.73(0.50) 0.68
                                                                                                                        628.9 21150.00
 PIPE-FLOW VELOCITY (FEET/SEC.) = 22.08
                                                                                   408.79 31.52 1.177 0.73 (0.50) 0.68
                                                                                                                       651.2 21121.00
 PIPE-FLOW(CFS) = 154.78
                                                                                   407.22 31.68 1.174 0.73(0.50) 0.68 652.1 21100.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                            TOTAL AREA(ACRES) =
                                                                                                 652.1
 PIPEFLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 15.87
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21165.00 = 7499.85 FEET.
                                                                           COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                           PEAK FLOW RATE (CFS) = 465.90 Tc (MIN.) = 21.686
******************
                                                                           EFFECTIVE AREA(ACRES) = 514.95 AREA-AVERAGED Fm(INCH/HR) = 0.50
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 81
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.68
                                                                           TOTAL AREA (ACRES) = 652.1
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
______
                                                                         ******************
 MAINLINE Tc(MIN.) = 15.87
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.777
                                                                           FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 71
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  ďΨ
                                                   SCS
                                                                           >>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<
 SCHOOL
                    B 1.72 0.75 0.600 56
                                                                         _____
 RESIDENTIAL
                                                                           UNIT-HYDROGRAPH DATA:
 "3-4 DWELLINGS/ACRE" B 10.42 0.75 0.600 56
                                                                           RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.84;3H= 1.38;6H= 1.88;24H= 3.60
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           S-GRAPH: VALLEY (DEV.) = 91.4%; VALLEY (UNDEV.) / DESERT= 8.6%
                                                                                 MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           Tc(HR) = 0.53; LAG(HR) = 0.42; Fm(INCH/HR) = 0.50; Ybar = 0.61
 SUBAREA AREA(ACRES) = 12.14
                            SUBAREA RUNOFF(CFS) = 14.51
 EFFECTIVE AREA(ACRES) = 141.36 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                           USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.72
                                                                           DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 TOTAL AREA (ACRES) = 189.1 PEAK FLOW RATE (CFS) =
                                                                           3HR = 1.00; 6HR = 1.00; 24HR = 1.00
                                                                           UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 652.1
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                           EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                           Lca/L=0.3,n=.0433; Lca/L=0.4,n=.0388; Lca/L=0.5,n=.0357; Lca/L=0.6,n=.0333
*******************
                                                                           TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 84.78
 FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 11
                                                                           UNIT-HYDROGRAPH METHOD PEAK FLOW RATE (CFS) = 502.47
                                                                           TOTAL PEAK FLOW RATE (CFS) = 502.47 (SOURCE FLOW INCLUDED)
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<
                                                                           RATIONAL METHOD PEAK FLOW RATE (CFS) = 465.90
______
                                                                           (UPSTREAM NODE PEAK FLOW RATE(CFS) = 465.90)
                                                                           PEAK FLOW RATE (CFS) USED = 502.47
 ** MAIN STREAM CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         ******************
  STREAM
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
                                                                          FLOW PROCESS FROM NODE 21165.00 TO NODE 21165.00 IS CODE = 12
         160.82 15.96 1.771 0.70(0.51)0.72 141.4 21160.00
          150.78 23.61 1.400 0.70(0.51) 0.73 189.1 21154.00
    2
                                                                          >>>>CLEAR MEMORY BANK # 2 <<<<
 LONGEST FLOWPATH FROM NODE 21154.00 TO NODE 21165.00 = 7499.85 FEET.
                                                                         ______
                                                                         ******************
 ** MEMORY BANK # 2 CONFLUENCE DATA **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                           FLOW PROCESS FROM NODE 21165.00 TO NODE 21166.00 IS CODE = 42
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          312.59 21.69 1.473 0.75(0.49) 0.65 337.9 21140.00
    1
                                                                          >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                          >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
          309.30 28.79 1.243 0.75(0.49) 0.66
                                            439.9 21150.00
          295.95 31.52 1.177 0.75(0.49) 0.66
                                            462.2 21121.00
                                                                         ______
          294.97 31.68
                       1.174 0.75 (0.49) 0.66 463.1 21100.00
                                                                           UPSTREAM NODE ELEVATION (FEET) = 1393.00
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21165.00 = 11365.46 FEET.
                                                                           DOWNSTREAM NODE ELEVATION (FEET) = 1357.00
                                                                           FLOW LENGTH (FEET) = 1083.24 MANNING'S N = 0.013
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae
                                                   HEADWATER
                                                                           USER SPECIFIED PIPE DIAMETER (INCH) = 85.00 NUMBER OF PIPES = 1
```

Date: 04/21/2014

File name: LR0211ZZ.RES

Date: 04/21/2014 File name: LR0211ZZ.RES Page 38

NODE

```
DEPTH OF FLOW IN 85.0 INCH PIPE IS 38.3 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 29.14
 PIPE-FLOW(CFS) = 502.47
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.62 Tc (MIN.) = 32.29
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
*******************
 FLOW PROCESS FROM NODE 21166.00 TO NODE 21166.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 32.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.160
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP Ap
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    в 28.30
                                     0.75 0.600 56
                                     0.75
 SCHOOL
                       В
                             18.42
                                               0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 46.72
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.64;1H= 0.83;3H= 1.37;6H= 1.88;24H= 3.59
 S-GRAPH: VALLEY (DEV.) = 92.0%; VALLEY (UNDEV.) / DESERT= 8.0%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.54; LAG(HR) = 0.43; Fm(INCH/HR) = 0.49; Ybar = 0.61
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 698.8
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21166.00 = 12448.70 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3, n=.0411; Lca/L=0.4, n=.0368; Lca/L=0.5, n=.0338; Lca/L=0.6, n=.0316
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 91.12
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 532.12
 TOTAL AREA (ACRES) = 698.8 PEAK FLOW RATE (CFS) = 532.12
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21166.00 TO NODE 21167.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1357.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1320.00
 FLOW LENGTH (FEET) = 1316.79 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 84.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 84.0 INCH PIPE IS 41.8 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 27.78
 PIPE-FLOW(CFS) = 532.12
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.79 Tc (MIN.) = 33.08
```

```
LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
******************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 33.08
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.143
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                 SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 42.55 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 42.55
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.83;3H= 1.37;6H= 1.88;24H= 3.58
 S-GRAPH: VALLEY(DEV.) = 92.4%; VALLEY(UNDEV.)/DESERT= 7.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.49; Ybar = 0.61
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
 3HR = 1.00; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 741.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0388; Lca/L=0.4, n=.0347; Lca/L=0.5, n=.0319; Lca/L=0.6, n=.0298
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 96.89
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 554.63
 TOTAL AREA (ACRES) = 741.4 PEAK FLOW RATE (CFS) = 554.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 152
>>>>STORE PEAK FLOWRATE TABLE TO A FILE <<<<
PEAK FLOWRATE TABLE FILE NAME: 21167.DNA
END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 741.4 TC (MIN.) =
                                        33.08
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.61
 PEAK FLOW RATE (CFS) = 554.63
______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

Date: 04/21/2014 File name: LR0211ZZ.RES Page 39 Date: 04/21/2014 File name: LR0211ZZ.RES Page 40

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21248

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0212ZZ.DAT

TIME/DATE OF STUDY: 08:02 10/28/2013

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85

\*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I; IN/HR) vs. LOG(Tc; MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\* HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING

HALL -	CKOMN 10	SIREEI-CROSSFALL.	COND	GOTIEK-GEOMETKIES.		DITHIHAM	
WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
=====	=======	==========	=====	=====	=====	=====	======
18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
	WIDTH (FT) ===== 18.0 20.0 22.0 15.0 15.0 16.0 17.0 30.0 24.0 24.0 32.0 39.0 36.0	WIDTH (FT) (FT)  ===== 18.0 12.0 20.0 15.0 22.0 15.0 15.0 10.0 18.0 10.0 16.0 10.0 17.0 10.0 17.0 10.0 30.0 15.0 24.0 15.0 24.0 15.0 32.0 20.0 39.0 20.0 36.0 20.0	WIDTH CROSSFALL IN- / OUT-/PARK-(FT) (FT) SIDE / SIDE / WAY  ===== ==============================	WIDTH (FT)         CROSSFALL (FT)         IN- / OUT-/PARK- (FT)         HEIGHT (FT)           18.0         12.0         0.020/0.020/0.020         0.67           20.0         15.0         0.020/0.020/0.020         0.67           22.0         15.0         0.020/0.020/0.020         0.67           15.0         10.0         0.020/0.020/0.020         0.50           18.0         10.0         0.020/0.020/0.020         0.50           18.0         10.0         0.020/0.020/0.020         0.50           15.0         10.0         0.020/0.020/0.020         0.67           16.0         10.0         0.020/0.020/0.020         0.67           16.0         10.0         0.020/0.020/0.020         0.67           17.0         10.0         0.020/0.020/0.020         0.67           30.0         15.0         0.020/0.020/0.020         0.67           24.0         15.0         0.020/0.020/0.020         0.50           24.0         15.0         0.020/0.020/0.020         0.67           32.0         20.0         0.020/0.020/0.020         0.67           39.0         20.0         0.020/0.020/0.020         0.67           39.0         20.0         0.020/0.020/0.020         <	WIDTH (FT)         CROSSFALL (FT)         IN- / OUT-/PARK- (FT)         HEIGHT (FT)         WIDTH (FT)           18.0 (12.0 (	WIDTH (FT)         CROSSFALL (FT)         IN- / OUT-/PARK- (FT)         HEIGHT (FT)         WIDTH (FT)         LIP (FT)           18.0         12.0         0.020/0.020/0.020         0.67         2.00         0.0312           20.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312           22.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312           15.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312           18.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312           18.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312           18.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312           15.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312           16.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312           17.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312           24.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312	WIDTH (FT)         CROSSFALL (FT)         IN- / OUT-/PARK- (FT)         HEIGHT (FT)         WIDTH LIP (FT)         HIKE (FT)           18.0         12.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           20.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           22.0         15.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           15.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.167           15.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.167           15.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.125           18.0         10.0         0.020/0.020/0.020         0.50         1.50         0.0312         0.125           15.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.125           16.0         10.0         0.020/0.020/0.020         0.67         2.00         0.0312         0.167           17.0         10.0         0.020/0.020/0.020         0.67         2.00

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 GLOBAL STREET FLOW-DEPTH CONSTRAINTS: 1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth) \* (Velocity) Constraint = 6.0 (FT\*FT/S) \*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\* \*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 \* Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. \*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\* \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21200.00 TO NODE 21201.00 IS CODE = 21 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<< \_\_\_\_\_ INITIAL SUBAREA FLOW-LENGTH (FEET) = 569.96 ELEVATION DATA: UPSTREAM(FEET) = 1740.00 DOWNSTREAM(FEET) = 1707.00 Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.219 \* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.461 SUBAREA To AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ SCS Tc αp GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.) LAND USE SCHOOL 0.54 0.75 0.600 56 9.22 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.10 0.75 0.600 56 9.22 RESIDENTIAL 4.38 0.75 0.700 9.80 "2 DWELLINGS/ACRE" В 56 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.673 SUBAREA RUNOFF(CFS) = 10.61 TOTAL AREA (ACRES) = 6.02 PEAK FLOW RATE (CFS) = 10 61 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21201.00 TO NODE 21202.00 IS CODE = 63 \_\_\_\_\_\_

>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 18 USED) <<<<

Date: 04/21/2014

\_\_\_\_\_\_ UPSTREAM ELEVATION (FEET) = 1707.00 DOWNSTREAM ELEVATION (FEET) = 1695.00 STREET LENGTH (FEET) = 243.63 CURB HEIGHT (INCHES) = 8.0

Date: 04/21/2014 File name: LR0212ZZ.RES Page 1 File name: LR0212ZZ.RES Page 2

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.77
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     21.77
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 14.43
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.79
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.14
 STREET FLOW TRAVEL TIME (MIN.) = 1.68 Tc (MIN.) = 11.79
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.123
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                          SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 8.92 0.75 0.700
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.90 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA(ACRES) = 9.82 SUBAREA RUNOFF(CFS) = 14.20
 EFFECTIVE AREA(ACRES) = 18.69 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 18.7 PEAK FLOW RATE (CFS) = 27.23
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.47 HALFSTREET FLOOD WIDTH (FEET) = 15.83
 FLOW VELOCITY (FEET/SEC.) = 5.05 DEPTH*VELOCITY (FT*FT/SEC.) = 2.40
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21203.00 = 1295.94 FEET.
******************
 FLOW PROCESS FROM NODE 21203.00 TO NODE 21204.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1675.00 DOWNSTREAM ELEVATION(FEET) = 1638.00
 STREET LENGTH (FEET) = 756.35 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.74
                                                     33.30
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.49
       Date: 04/21/2014 File name: LR0212ZZ.RES
```

STREET PARKWAY CROSSFALL (DECIMAL) = 0.020

Date: 04/21/2014 File name: LR0212ZZ.RES Page 3

OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

Page 4

```
HALFSTREET FLOOD WIDTH (FEET) = 16.60
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.66
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.77
 STREET FLOW TRAVEL TIME (MIN.) = 2.23 Tc (MIN.) = 14.02
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.914
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                               qΑ
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                      B 7.90
                                         0.75
                                                 0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.70 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
 SUBAREA AREA (ACRES) = 9.60 SUBAREA RUNOFF (CFS) = 12.13
 EFFECTIVE AREA(ACRES) = 28.29 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 28.3 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 17.12
 FLOW VELOCITY (FEET/SEC.) = 5.74 DEPTH*VELOCITY (FT*FT/SEC.) = 2.87
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21204.00 = 2052.29 FEET.
******************
 FLOW PROCESS FROM NODE 21204.00 TO NODE 21205.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1638.00 DOWNSTREAM ELEVATION(FEET) = 1633.00
 STREET LENGTH (FEET) = 323.24 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.99
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
  HALFSTREET FLOOD WIDTH (FEET) = 22.57
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.82
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.33
 STREET FLOW TRAVEL TIME (MIN.) = 1.41 Tc (MIN.) = 15.43
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.807
 SUBAREA LOSS RATE DATA (AMC II):
                                              Ар
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fp
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

```
RESIDENTIAL.
 "2 DWELLINGS/ACRE"
                        B 6.52
                                        0.75
                                                0.700
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 1.27 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 7.79 SUBAREA RUNOFF (CFS) = 9.08
 EFFECTIVE AREA(ACRES) = 36.08 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 36.1 PEAK FLOW RATE (CFS) = 42.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.62 HALFSTREET FLOOD WIDTH (FEET) = 22.92
 FLOW VELOCITY (FEET/SEC.) = 3.87 DEPTH*VELOCITY (FT*FT/SEC.) = 2.39
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21205.00 = 2375.53 FEET.
FLOW PROCESS FROM NODE 21205.00 TO NODE 21206.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1633.00 DOWNSTREAM ELEVATION(FEET) = 1629.00
 STREET LENGTH (FEET) = 199.37 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.92
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  45.21
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH (FEET) = 22.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.63
 STREET FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 16.20
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.755
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.19
                                        0.75
                                                0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                             4.19 0.75 0.700
                                                       56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.678
 SUBAREA AREA (ACRES) = 5.38 SUBAREA RUNOFF (CFS) = 6.04
 EFFECTIVE AREA(ACRES) = 41.46 AREA-AVERAGED Fm(INCH/HR) = 0.51
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 6

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) =
                    41.5 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 22.69
 FLOW VELOCITY (FEET/SEC.) = 4.36 DEPTH*VELOCITY (FT*FT/SEC.) = 2.67
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21206.00 = 2574.90 FEET.
******************
 FLOW PROCESS FROM NODE 21206.00 TO NODE 21207.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1629.00 DOWNSTREAM ELEVATION(FEET) = 1610.00
 STREET LENGTH (FEET) = 607.72 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.83
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.59
   HALFSTREET FLOOD WIDTH (FEET) = 21.34
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.08
 STREET FLOW TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 18.12
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.641
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                Ар
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.03
                                        0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.49
                                         0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.677
                              SUBAREA RUNOFF(CFS) = 6.66
 SUBAREA AREA(ACRES) = 6.52
 EFFECTIVE AREA(ACRES) = 47.98 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 48.0 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.17
```

```
LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21207.00 = 3182.62 FEET.
FLOW PROCESS FROM NODE 21207.00 TO NODE 21208.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH (FEET) = 532.97 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   52.72
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.05
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.71
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.30
 STREET FLOW TRAVEL TIME (MIN.) = 1.56 Tc (MIN.) = 19.68
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.562
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 6.92 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      B 1.09 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.686
 SUBAREA AREA (ACRES) = 8.01 SUBAREA RUNOFF (CFS) = 7.56
 EFFECTIVE AREA(ACRES) = 55.99 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 56.0 PEAK FLOW RATE (CFS) =
                                                         53.08
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.11
 FLOW VELOCITY (FEET/SEC.) = 5.71 DEPTH*VELOCITY (FT*FT/SEC.) = 3.32
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21208.00 = 3715.59 FEET.
*****************
 FLOW PROCESS FROM NODE 21208.00 TO NODE 21209.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
```

FLOW VELOCITY (FEET/SEC.) = 5.24 DEPTH\*VELOCITY (FT\*FT/SEC.) = 3.05

Date: 04/21/2014 File name: LR021277.RFS

Page 8

```
_____
 UPSTREAM ELEVATION(FEET) = 1590.00 DOWNSTREAM ELEVATION(FEET) = 1550.00
 STREET LENGTH (FEET) = 677.51 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.72
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                   54.95
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.55
   HALFSTREET FLOOD WIDTH (FEET) = 19.58
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.75
 STREET FLOW TRAVEL TIME (MIN.) = 1.65 Tc (MIN.) = 21.33
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.488
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                        SCS
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MOBILE HOME PARK
                     в 0.99 0.75
                                               0.250 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      В
                              2.98 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.588
                               SUBAREA RUNOFF(CFS) = 3.74
 SUBAREA AREA(ACRES) = 3.97
 EFFECTIVE AREA(ACRES) = 59.96 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 60.0 PEAK FLOW RATE (CFS) =
                                                         53.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.29
 FLOW VELOCITY (FEET/SEC.) = 6.79 DEPTH*VELOCITY (FT*FT/SEC.) = 3.69
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21209.00 = 4393.10 FEET.
*****************
 FLOW PROCESS FROM NODE 21209.00 TO NODE 21215.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1520.00
 FLOW LENGTH (FEET) = 978.51 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 4.00 GIVEN BOX HEIGHT (FEET) = 2.00
 FLOWDEPTH IN BOX IS 0.96 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 13.88
 BOX-FLOW(CFS) = 53.10
 BOX-FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 22.51
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
```

```
******************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 22.51
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.441
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                                  SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.58 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 5.58
                            SUBAREA RUNOFF (CFS) = 4.98
 EFFECTIVE AREA(ACRES) = 65.54 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 65.5
                             PEAK FLOW RATE(CFS) =
                                                   55.54
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
******************
 FLOW PROCESS FROM NODE 21213.30 TO NODE 21213.40 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 760.53
 ELEVATION DATA: UPSTREAM(FEET) = 1700.00 DOWNSTREAM(FEET) = 1690.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.918
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.922
 SUBAREA To AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                          qА
                                                  SCS Tc
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 SCHOOL
                    B 8.73 0.75 0.600
                                                   56 13.92
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.08
                                    0.75 0.600
                                                   56 13.92
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 13.01
 TOTAL AREA(ACRES) = 9.81 PEAK FLOW RATE(CFS) = 13.01
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
FLOW PROCESS FROM NODE 21213.40 TO NODE 21213.50 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 9

File name: LR0212ZZ.RES

Page 10

Date: 04/21/2014

UPSTREAM ELEVATION(FEET) = 1640.00 DOWNSTREAM ELEVATION(FEET) = 1540.00 STREET LENGTH(FEET) = 2138.50 CURB HEIGHT(INCHES) = 6.0 STREET HALFWIDTH(FEET) = 18.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.69
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.46
   HALFSTREET FLOOD WIDTH (FEET) = 16.71
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.50
 STREET FLOW TRAVEL TIME (MIN.) = 6.56 Tc (MIN.) = 28.69
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.246
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                     SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 14.39
                                       0.75 0.700
                                                      56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 1.85 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689
 SUBAREA AREA(ACRES) = 16.24 SUBAREA RUNOFF(CFS) = 10.68
 EFFECTIVE AREA(ACRES) = 46.16 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
 TOTAL AREA(ACRES) = 46.2 PEAK FLOW RATE(CFS) =
                                                       31.31
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.46 HALFSTREET FLOOD WIDTH (FEET) = 16.63
 FLOW VELOCITY (FEET/SEC.) = 5.43 DEPTH*VELOCITY (FT*FT/SEC.) = 2.49
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
*******************
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 21210.00 TO NODE 21211.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 788.20
 ELEVATION DATA: UPSTREAM(FEET) = 1650.00 DOWNSTREAM(FEET) = 1625.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.838
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.118
 SUBAREA TC AND LOSS RATE DATA (AMC II):
```

File name: LR0212ZZ.RES

Page 12

Date: 04/21/2014

```
DEVELOPMENT TYPE/
                SCS SOIL AREA
                                  Fр
                                                SCS Tc
                                          Αp
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                          4.70
                                   0.75
                                         0.700
                                               56 12.59
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   B 0.64 0.75 0.600
                                               56 11.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA RUNOFF (CFS) = 7.71
 TOTAL AREA (ACRES) = 5.34 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21211.00 TO NODE 21212.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1625.00 DOWNSTREAM(FEET) = 1610.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 337.81 CHANNEL SLOPE = 0.0444
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 5.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.32 FLOW DEPTH (FEET) = 0.68
 TRAVEL TIME (MIN.) = 1.70 Tc (MIN.) = 13.54
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21212.00 = 1126.01 FEET.
FLOW PROCESS FROM NODE 21212.00 TO NODE 21212.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 13.54
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.955
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                                SCS
                                        αA
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B
                         7.68
                                   0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.700
 SUBAREA AREA(ACRES) = 7.68
                           SUBAREA RUNOFF (CFS) = 9.89
 EFFECTIVE AREA(ACRES) = 13.02 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA(ACRES) = 13.0
                          PEAK FLOW RATE(CFS) =
                                                16.81
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
FLOW PROCESS FROM NODE 21212.00 TO NODE 21213.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1592.00
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 463.88 CHANNEL SLOPE = 0.0388
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            16.81
 FLOW VELOCITY (FEET/SEC.) = 3.30 FLOW DEPTH (FEET) = 0.71
 TRAVEL TIME (MIN.) = 2.35 Tc (MIN.) = 15.88
 LONGEST FLOWPATH FROM NODE 21210.00 TO NODE 21213.00 = 1589.89 FEET.
******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 15.88
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.776
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                             Αр
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 5.46
                                     0.75
                                            0.700
                                                   56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.60 0.75 0.600
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
 SUBAREA AREA(ACRES) = 6.06
                            SUBAREA RUNOFF (CFS) = 6.87
 EFFECTIVE AREA(ACRES) = 19.08 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
 TOTAL AREA (ACRES) = 19.1
                             PEAK FLOW RATE(CFS) =
                                                   21.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.88
 RAINFALL INTENSITY (INCH/HR) = 1.78
 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.69
 EFFECTIVE STREAM AREA(ACRES) = 19.08
 TOTAL STREAM AREA(ACRES) = 19.08
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 21.59
FLOW PROCESS FROM NODE 21213.10 TO NODE 21213.20 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 686.22
 ELEVATION DATA: UPSTREAM(FEET) = 1642.00 DOWNSTREAM(FEET) = 1610.00
 Tc = K^*[(LENGTH^** 3.00)/(ELEVATION CHANGE)]^**0.20
```

Date: 04/21/2014 File name: LR021277.RFS Page 13 Date: 04/21/2014 File name: LR0212ZZ.RES

Page 14

```
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.369
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.294
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap SCS Tc
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                             END OF SUBAREA STREET FLOW HYDRAULICS:
     LAND USE
 PUBLIC PARK
                     В 1.60
                                       0.75
                                              0.850
                                                    56 12.16
                                                                             DEPTH(FEET) = 0.37 HALFSTREET FLOOD WIDTH(FEET) = 11.95
 RESIDENTIAL
                                                                             FLOW VELOCITY (FEET/SEC.) = 2.85 DEPTH*VELOCITY (FT*FT/SEC.) = 1.04
 "2 DWELLINGS/ACRE" B 1.75
                                       0.75
                                              0.700
                                                    56 11.02
                                                                             LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.25 0.75 0.600 56 10.37
                                                                            *******************
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             FLOW PROCESS FROM NODE 21213.00 TO NODE 21213.00 IS CODE = 1
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.760
 SUBAREA RUNOFF (CFS) = 5.59
                                                                             >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 TOTAL AREA(ACRES) = 3.60 PEAK FLOW RATE(CFS) = 5.59
                                                                             >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                            ______
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                             TOTAL NUMBER OF STREAMS = 2
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                             CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                             TIME OF CONCENTRATION (MIN.) = 16.03
******************
                                                                             RAINFALL INTENSITY (INCH/HR) = 1.77
 FLOW PROCESS FROM NODE 21213.20 TO NODE 21213.00 IS CODE = 63
                                                                             AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                             AREA-AVERAGED Ap = 0.73
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                             EFFECTIVE STREAM AREA(ACRES) = 8.03
______
                                                                             TOTAL STREAM AREA(ACRES) = 8.03
 UPSTREAM ELEVATION(FEET) = 1610.00 DOWNSTREAM ELEVATION(FEET) = 1592.00
                                                                             PEAK FLOW RATE (CFS) AT CONFLUENCE = 8.82
 STREET LENGTH (FEET) = 944.44 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
                                                                             ** CONFLUENCE DATA **
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                       (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                              NUMBER
                                                                                       21.59 15.88 1.776 0.75(0.52) 0.69 19.1 21210.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              1
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                      8.82 16.03 1.766 0.75(0.55) 0.73 8.0 21213.10
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                             RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                             CONFLUENCE FORMULA USED FOR 2 STREAMS.
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             ** PEAK FLOW RATE TABLE **
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                                              STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                              NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                                       30.40 15.88 1.776 0.75(0.53) 0.70 27.0 21210.00
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 8.08
                                                                              1
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                       30.24 16.03 1.766 0.75(0.53)0.70 27.1 21213.10
   STREET FLOW DEPTH(FEET) = 0.36
   HALFSTREET FLOOD WIDTH (FEET) = 11.55
                                                                             COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             PEAK FLOW RATE (CFS) = 30.40 Tc (MIN.) = 15.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.99
                                                                             EFFECTIVE AREA(ACRES) = 27.04 AREA-AVERAGED Fm(INCH/HR) = 0.53
 STREET FLOW TRAVEL TIME (MIN.) = 5.66 Tc (MIN.) = 16.03
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
                                                                             TOTAL AREA (ACRES) = 27.1
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.766
 SUBAREA LOSS RATE DATA(AMC II):
                                                                             LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21213.00 = 1630.66 FEET.
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                             Aр
                                                     SCS
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                            LAND USE
 PUBLIC PARK
                     B 0.14 0.75 0.850 56
                                                                             FLOW PROCESS FROM NODE 21213.00 TO NODE 21214.00 IS CODE = 54
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 4.29 0.75 0.700 56
                                                                             >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.705
                                                                            ______
 SUBAREA AREA(ACRES) = 4.43 SUBAREA RUNOFF(CFS) = 4.94
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1592.00 DOWNSTREAM(FEET) = 1540.00
 EFFECTIVE AREA(ACRES) = 8.03 AREA-AVERAGED Fm(INCH/HR) = 0.55
                                                                             CHANNEL LENGTH THRU SUBAREA (FEET) = 580.67 CHANNEL SLOPE = 0.0896
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.73
                                                                             CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 10.000
 TOTAL AREA (ACRES) = 8.0 PEAK FLOW RATE (CFS) = 8.82
                                                                             MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 15

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 16

```
CHANNEL FLOW THRU SUBAREA(CFS) =
                            30.40
 FLOW VELOCITY (FEET/SEC.) = 5.18 FLOW DEPTH (FEET) = 0.77
 TRAVEL TIME (MIN.) = 1.87 Tc (MIN.) = 17.75
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
______
 MAINLINE Tc(MIN.) = 17.75
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.661
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fр
                                        Аp
                                                SCS
    LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                   B 4.04 0.75
                                          0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.60 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA AREA (ACRES) = 4.64 SUBAREA RUNOFF (CFS) = 4.79
 EFFECTIVE AREA(ACRES) = 31.68 AREA-AVERAGED Fm(INCH/HR) = 0.52
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.70
 TOTAL AREA (ACRES) = 31.8 PEAK FLOW RATE (CFS) = 32.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
******************
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
 NUMBER
        (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          32.40 17.75 1.661 0.75(0.52)0.70 31.7 21210.00
   1
    2
          32.22 17.91 1.653 0.75(0.52) 0.70 31.8 21213.10
 LONGEST FLOWPATH FROM NODE 21213.10 TO NODE 21214.00 = 2211.33 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
          31.31 28.69 1.246 0.75(0.49) 0.66 46.2 21213.30
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          62.46 17.75 1.661 0.75(0.51) 0.68 60.2 21210.00
          62.32 17.91 1.653 0.75 (0.51) 0.68 60.6 21213.10
   3
          51.91 28.69 1.246 0.75(0.51) 0.68 77.9 21213.30
  TOTAL AREA(ACRES) =
                      77.9
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 62.46 Tc (MIN.) = 17.750
```

```
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 77.9
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21214.00 = 4851.64 FEET.
FLOW PROCESS FROM NODE 21214.00 TO NODE 21214.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<
******************
 FLOW PROCESS FROM NODE 21214.00 TO NODE 21215.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 2 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1540.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 STREET LENGTH (FEET) = 601.35 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 20.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                67.01
   ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.62
  HALFSTREET FLOOD WIDTH (FEET) = 20.00
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.18
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.83
 STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 19.37
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.576
 SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                            qΑ
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.90
                                      0.75
                                             0.600
                                                     56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                    В 8.64 0.75
                                             0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.691
 SUBAREA AREA(ACRES) = 9.54 SUBAREA RUNOFF(CFS) = 9.10
 EFFECTIVE AREA(ACRES) = 69.78 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 87.5 PEAK FLOW RATE (CFS) =
                                                     66.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
```

Date: 04/21/2014 File name: LR0212ZZ.RES

Page 18

EFFECTIVE AREA(ACRES) = 60.24 AREA-AVERAGED Fm(INCH/HR) = 0.51

```
DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 20.00
                                                                        LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21216.00 = 6824.53 FEET.
 FLOW VELOCITY (FEET/SEC.) = 6.17 DEPTH*VELOCITY (FT*FT/SEC.) = 3.83
                                                                       ******************
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                        FLOW PROCESS FROM NODE 21216.00 TO NODE 21216.00 IS CODE = 81
************************
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 11
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                       ______
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<
                                                                        MAINLINE Tc(MIN.) = 20.66
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.517
                                                                        SUBAREA LOSS RATE DATA (AMC II):
                                                                         DEVELOPMENT TYPE/ SCS SOIL AREA
 ** MAIN STREAM CONFLUENCE DATA **
                                                                                                         Fp Ap
                                                                                                                         SCS
                                                                            LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
  STREAM
                Tc Intensity Fp(Fm) Ap Ae
                                                 HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                        RESIDENTIAL
          66.96 19.37 1.576 0.75(0.51) 0.68 69.8 21210.00
                                                                        "3-4 DWELLINGS/ACRE" B 23.70
   1
                                                                                                         0.75 0.600
          66.78 19.53
                      1.569 0.75(0.51)0.68
                                           70.1 21213.10
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
          54.73 30.45
                      1.202 0.75(0.51)0.68
                                             87.5 21213.30
    3
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                        SUBAREA AREA(ACRES) = 23.70
                                                                                                   SUBAREA RUNOFF (CFS) = 22.78
                                                                        EFFECTIVE AREA(ACRES) = 149.88 AREA-AVERAGED Fm(INCH/HR) = 0.50
 ** MEMORY BANK # 2 CONFLUENCE DATA **
                                                                        AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
  STREAM
           0
               Tc Intensity Fp(Fm)
                                                 HEADWATER
                                                                        TOTAL AREA(ACRES) = 176.7
                                                                                                     PEAK FLOW RATE(CFS) =
                                         Ae
                                                                                                                       137.67
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
   1
          55.54 22.51 1.441 0.75(0.50) 0.67 65.5 21200.00
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 LONGEST FLOWPATH FROM NODE 21200.00 TO NODE 21215.00 = 5371.61 FEET.
                                                                        5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 ** PEAK FLOW RATE TABLE **
                                                                        ** PEAK FLOW RATE TABLE **
  STREAM
         Q
               Tc Intensity Fp(Fm)
                                      Ap Ae HEADWATER
                                                                         STREAM
                                                                                Q
                                                                                       Tc Intensity Fp(Fm)
                                                                                                              Ap Ae HEADWATER
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                           (ACRES) NODE
                                                                         NUMBER
                                                                                (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                  (ACRES) NODE
   1
         121.65 19.37
                      1.576 0.75(0.51)0.68
                                           126.2 21210.00
                                                                         1
                                                                                 138.08 20.59
                                                                                             1.520 0.75 (0.50) 0.66 149.9 21210.00
                                                                                             1.516 0.75(0.50) 0.66
                                                                                                                    150.7 21213.10
    2
         121.53 19.53
                      1.569 0.75(0.51) 0.68
                                           127.0 21213.10
                                                                                 138.23 20.69
    3
         119.04 22.51
                      1.441 0.75(0.50) 0.67
                                            140.4 21200.00
                                                                                 133.46 23.60 1.400 0.75(0.50) 0.66
                                                                                                                    164.1 21200.00
          96.18 30.45 1.202 0.75(0.50) 0.67
                                                                                 108.16 31.56 1.176 0.75(0.50) 0.66
                                                                                                                    176.7 21213.30
                                           153.0 21213.30
  TOTAL AREA (ACRES) =
                      153.0
                                                                        NEW PEAK FLOW DATA ARE:
                                                                        PEAK FLOW RATE (CFS) = 138.23 Tc (MIN.) = 20.69
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                        AREA-AVERAGED Fm(INCH/HR) = 0.50 AREA-AVERAGED Fp(INCH/HR) = 0.75
 PEAK FLOW RATE (CFS) = 121.65 Tc (MIN.) = 19.372
                                                                        AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) =
 EFFECTIVE AREA(ACRES) = 126.18 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                       ***********************
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA(ACRES) = 153.0
                                                                         FLOW PROCESS FROM NODE 21216.00 TO NODE 21217.00 IS CODE = 48
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21215.00 = 5452.99 FEET.
                                                                       ______
                                                                        >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
*****************
                                                                        >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21215.00 IS CODE = 12
                                                                        ELEVATION DATA: UPSTREAM(FEET) = 1470.00 DOWNSTREAM(FEET) = 1415.00
 >>>>CLEAR MEMORY BANK # 2 <<<<
                                                                        FLOW LENGTH (FEET) = 1351.25 MANNING'S N = 0.014
                                                                        GIVEN BOX BASEWIDTH (FEET) = 7.00 GIVEN BOX HEIGHT (FEET) = 3.00
______
                                                                        FLOWDEPTH IN BOX IS 1.06 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 18.67
*******************
                                                                        BOX-FLOW(CFS) = 138.23
 FLOW PROCESS FROM NODE 21215.00 TO NODE 21216.00 IS CODE = 48
                                                                        BOX-FLOW TRAVEL TIME (MIN.) = 1.21 Tc (MIN.) = 21.89
                                                                        LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21217.00 = 8175.78 FEET.
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                       *******************
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
_____
                                                                        FLOW PROCESS FROM NODE 21217.00 TO NODE 21217.00 IS CODE = 81
 ELEVATION DATA: UPSTREAM(FEET) = 1520.00 DOWNSTREAM(FEET) = 1470.00
                                                                       ______
 FLOW LENGTH (FEET) = 1371.54 MANNING'S N = 0.014
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 GIVEN BOX BASEWIDTH(FEET) = 6.00 GIVEN BOX HEIGHT(FEET) = 3.00
                                                                       _____
 FLOWDEPTH IN BOX IS 1.14 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 17.79
                                                                        MAINLINE Tc(MIN.) = 21.89
 BOX-FLOW(CFS) = 121.65
                                                                        * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.465
 BOX-FLOW TRAVEL TIME (MIN.) = 1.28 Tc (MIN.) = 20.66
                                                                        SUBAREA LOSS RATE DATA (AMC II):
```

Date: 04/21/2014

File name: LR021277.RFS

Page 20

```
DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                    Fр
                                                   SCS
                                             Αр
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
     LAND USE
 RESIDENTIAL
                                                                          5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 "3-4 DWELLINGS/ACRE"
                   В
                           12.77 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          ** PEAK FLOW RATE TABLE **
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           STREAM
                                                                                  Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 SUBAREA AREA(ACRES) = 12.77
                            SUBAREA RUNOFF (CFS) = 11.68
                                                                          NUMBER
                                                                                    (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                                                                                                     (ACRES) NODE
                                                                                                                     183.2 21213.10
 EFFECTIVE AREA(ACRES) = 163.46 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                           1
                                                                                   150.99 23.51 1.404 0.75(0.49) 0.65
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.66
                                                                                  150.02 23.56 1.402 0.75(0.49) 0.65 182.4 21210.00
 TOTAL AREA (ACRES) = 189.5 PEAK FLOW RATE (CFS) = 143.04
                                                                                                                      196.6 21200.00
                                                                                   145.67 26.31 1.312 0.75(0.49) 0.65
                                                                                   118.55 34.33 1.118 0.75(0.49) 0.65
                                                                                                                       209.2 21213.30
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          NEW PEAK FLOW DATA ARE:
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                          PEAK FLOW RATE (CFS) = 150.02 Tc (MIN.) = 23.56
                                                                          AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.75
 ** PEAK FLOW RATE TABLE **
                                                                          AREA-AVERAGED Ap = 0.65 EFFECTIVE AREA(ACRES) =
  STREAM
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                         ******************
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
         143.28 21.73 1.471 0.75(0.49) 0.66 162.7 21210.00
                                                                          FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 10
    2
         143.76 21.77 1.470 0.75(0.49) 0.66
                                            163.5 21213.10
         138.69 24.65 1.364 0.75(0.49) 0.66
                                            176.8 21200.00
                                                                          >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
         112.57 32.63 1.153 0.75(0.49) 0.66
                                            189.5 21213.30
                                                                         _____
 NEW PEAK FLOW DATA ARE:
                                                                         PEAK FLOW RATE (CFS) = 143.76 Tc (MIN.) = 21.77
 AREA-AVERAGED Fm(INCH/HR) = 0.49 AREA-AVERAGED Fp(INCH/HR) = 0.75
                                                                          FLOW PROCESS FROM NODE 21220.00 TO NODE 21221.00 IS CODE = 21
 AREA-AVERAGED Ap = 0.66 EFFECTIVE AREA(ACRES) = 163.46
                                                                          >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS
*******************
                                                                          >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 FLOW PROCESS FROM NODE 21217.00 TO NODE 21236.00 IS CODE = 48
                                                                         _____
                                                                          INITIAL SUBAREA FLOW-LENGTH (FEET) = 765.06
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1620.00 DOWNSTREAM(FEET) = 1580.00
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                          Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1358.00
                                                                          SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.585
 FLOW LENGTH (FEET) = 1911.29 MANNING'S N = 0.014
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.265
 GIVEN BOX BASEWIDTH (FEET) = 8.00 GIVEN BOX HEIGHT (FEET) = 3.00
                                                                          SUBAREA TC AND LOSS RATE DATA (AMC II):
 FLOWDEPTH IN BOX IS 1.09 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.51
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
                                                                                                                            SCS Tc
                                                                                                                      αA
                                                                              LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 BOX-FLOW(CFS) = 143.76
 BOX-FLOW TRAVEL TIME (MIN.) = 1.93 Tc (MIN.) = 23.70
                                                                          PUBLIC PARK
                                                                                                      8.02
                                                                                                              0.75
                                                                                                                     0.850
                                                                                                                             56 12.41
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.
                                                                          RESIDENTIAL
                                                                          "2 DWELLINGS/ACRE"
                                                                                            в 0.68
                                                                                                              0.75
                                                                                                                     0.700
                                                                                                                             56 11.25
******************
                                                                          RESIDENTIAL
                                                                                                    0.28
                                                                                                              0.75
                                                                                                                     0.600
 FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 81
                                                                          "3-4 DWELLINGS/ACRE" B
                                                                                                                             56 10.59
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.831
                                                                          SUBAREA RUNOFF(CFS) = 13.29
______
 MAINLINE Tc(MIN.) = 23.70
                                                                          TOTAL AREA(ACRES) = 8.98 PEAK FLOW RATE(CFS) = 13.29
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.397
 SUBAREA LOSS RATE DATA (AMC II):
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                             Ар
                                                                          5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         ******************
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.73
                                                                          FLOW PROCESS FROM NODE 21221.00 TO NODE 21222.00 IS CODE = 54
                                     0.75
                                            0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                         _____
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                          >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 SUBAREA AREA(ACRES) = 19.73 SUBAREA RUNOFF(CFS) = 16.83
                                                                          >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
 EFFECTIVE AREA(ACRES) = 183.19 AREA-AVERAGED Fm(INCH/HR) = 0.49
                                                                         ______
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
                                                                          ELEVATION DATA: UPSTREAM(FEET) = 1580.00 DOWNSTREAM(FEET) = 1515.00
 TOTAL AREA (ACRES) = 209.2 PEAK FLOW RATE (CFS) = 149.86
                                                                          CHANNEL LENGTH THRU SUBAREA (FEET) = 731.02 CHANNEL SLOPE = 0.0889
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 21

File name: LR0212ZZ.RES

Page 22

Date: 04/21/2014

```
MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.92
 CHANNEL FLOW THRU SUBAREA(CFS) =
                               13.29
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.47
 FLOW VELOCITY (FEET/SEC.) = 2.80 FLOW DEPTH (FEET) = 0.31
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.62 Tc (MIN.) = 16.55
 TRAVEL TIME (MIN.) = 4.35 Tc (MIN.) = 14.94
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.732
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21222.00 = 1496.08 FEET.
                                                                                SUBAREA LOSS RATE DATA (AMC II):
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fρ
******************
                                                                                    LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 FLOW PROCESS FROM NODE 21222.00 TO NODE 21222.00 IS CODE = 81
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 11.55 0.75 0.600
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
_____
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 MAINLINE TC (MIN.) = 14.94
                                                                                SUBAREA AREA (ACRES) = 11.55 SUBAREA RUNOFF (CFS) = 13.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.843
                                                                                EFFECTIVE AREA(ACRES) = 37.82 AREA-AVERAGED Fm(INCH/HR) = 0.56
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.79
                                                                                TOTAL AREA (ACRES) = 37.8 PEAK FLOW RATE (CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                           qΑ
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.88
                                        0.75
                                                0.600
                                                      56
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                     в 9.97
                                        0.63
                                                1.000
                                                       6.5
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 PUBLIC PARK
                      В
                             3.94
                                        0.75
                                                0.850 56
                                                                                DEPTH(FEET) = 0.51 HALFSTREET FLOOD WIDTH(FEET) = 18.74
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.13 DEPTH*VELOCITY (FT*FT/SEC.) = 2.64
 RESIDENTIAL
                      B 2.50
                                        0.75 0.700 56
                                                                                LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21223.00 = 1973.58 FEET.
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
                                                                              *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.902
 SUBAREA AREA(ACRES) = 17.29 SUBAREA RUNOFF(CFS) = 19.23
                                                                                FLOW PROCESS FROM NODE 21223.00 TO NODE 21224.00 IS CODE = 63
                                                                              ______
 EFFECTIVE AREA(ACRES) = 26.27 AREA-AVERAGED Fm(INCH/HR) = 0.61
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.88
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 TOTAL AREA(ACRES) = 26.3 PEAK FLOW RATE(CFS) =
                                                       29.10
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
                                                                              _____
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                UPSTREAM ELEVATION(FEET) = 1500.00 DOWNSTREAM ELEVATION(FEET) = 1480.00
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                                STREET LENGTH (FEET) = 869.02 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET HALFWIDTH (FEET) = 18.00
*********************
 FLOW PROCESS FROM NODE 21222.00 TO NODE 21223.00 IS CODE = 63
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 UPSTREAM ELEVATION(FEET) = 1515.00 DOWNSTREAM ELEVATION(FEET) = 1500.00
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET LENGTH (FEET) = 477.50 CURB HEIGHT (INCHES) = 6.0
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                 ***STREET FLOWING FULL***
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET FLOW DEPTH(FEET) = 0.56
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 HALFSTREET FLOOD WIDTH (FEET) = 21.12
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                 AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.95
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                 PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.78
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 2.93 Tc (MIN.) = 19.48
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.571
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 35.77
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   ***STREET FLOWING FULL***
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                    LAND USE
                                                                                                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   STREET FLOW DEPTH(FEET) = 0.50
                                                                                RESIDENTIAL
```

HALFSTREET FLOOD WIDTH (FEET) = 18.07

SCS

39.84

47.81

CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000

Date: 04/21/2014 Page 23 Date: 04/21/2014 File name: LR0212ZZ.RES File name: LR021277.RFS Page 24

```
"3-4 DWELLINGS/ACRE" B 8.47 0.75 0.600 56
 AGRICULTURAL FAIR COVER
                                8.69 0.63 1.000 65
 "ORCHARDS"
                         В
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.803
 SUBAREA AREA (ACRES) = 17.16 SUBAREA RUNOFF (CFS) = 15.92
 EFFECTIVE AREA(ACRES) = 54.98 AREA-AVERAGED Fm(INCH/HR) = 0.56
 AREA-AVERAGED Fp(INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.80
 TOTAL AREA (ACRES) = 55.0 PEAK FLOW RATE (CFS) =
                                                          50.27
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.57 HALFSTREET FLOOD WIDTH(FEET) = 21.49
 FLOW VELOCITY (FEET/SEC.) = 5.04 DEPTH*VELOCITY (FT*FT/SEC.) = 2.87
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21224.00 = 2842.60 FEET.
FLOW PROCESS FROM NODE 21224.00 TO NODE 21225.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1480.00 DOWNSTREAM ELEVATION(FEET) = 1473.00
 STREET LENGTH (FEET) = 240.38 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.88
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.60
   HALFSTREET FLOOD WIDTH (FEET) = 22.04
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.10
 STREET FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 20.25
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.535
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fр
                                                  Ар
                                                        SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
                              3.82
 "3-4 DWELLINGS/ACRE" B
                                         0.75
                                                 0.600 56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                              0.13
                                         0.63 1.000 65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.613
 SUBAREA AREA (ACRES) = 3.95 SUBAREA RUNOFF (CFS) = 3.84
 EFFECTIVE AREA(ACRES) = 58.93 AREA-AVERAGED Fm(INCH/HR) = 0.55
 AREA-AVERAGED Fp (INCH/HR) = 0.70 AREA-AVERAGED Ap = 0.78
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60 HALFSTREET FLOOD WIDTH(FEET) = 22.04
 FLOW VELOCITY (FEET/SEC.) = 5.18 DEPTH*VELOCITY (FT*FT/SEC.) = 3.10
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21225.00 = 3082.98 FEET.
******************
 FLOW PROCESS FROM NODE 21225.00 TO NODE 21233.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1473.00 DOWNSTREAM(FEET) = 1423.00
 FLOW LENGTH (FEET) = 1355.56 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 1.50
 FLOWDEPTH IN BOX IS 0.65 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 13.39
 BOX-FLOW(CFS) =
                  52.31
 BOX-FLOW TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 21.94
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET.
******************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 21.94
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.463
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                            αA
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 16.86 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 16.86
                             SUBAREA RUNOFF(CFS) = 15.39
 EFFECTIVE AREA(ACRES) = 75.79 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.71 AREA-AVERAGED Ap = 0.74
 TOTAL AREA (ACRES) = 75.8
                               PEAK FLOW RATE(CFS) =
                                                     63.89
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*******************
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 21.94
 RAINFALL INTENSITY (INCH/HR) = 1.46
 AREA-AVERAGED Fm(INCH/HR) = 0.53
 AREA-AVERAGED Fp (INCH/HR) = 0.71
 AREA-AVERAGED Ap = 0.74
```

File name: LR021277.RFS

Date: 04/21/2014

TOTAL AREA (ACRES) = 58.9 PEAK FLOW RATE (CFS) =

52.31

Page 26

```
EFFECTIVE STREAM AREA(ACRES) = 75.79
 TOTAL STREAM AREA(ACRES) = 75.79
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 63.89
************************
 FLOW PROCESS FROM NODE 21230.00 TO NODE 21231.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 568.64
 ELEVATION DATA: UPSTREAM(FEET) = 1480.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K^*[(LENGTH^** 3.00)/(ELEVATION CHANGE)]^**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 9.384
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.435
 SUBAREA To AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                             Ap SCS Tc
                                   Fр
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В
                            4.58
                                    0.75 0.600 56 9.38
                     В
                            0.10 0.75 0.600 56 9.38
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 8.37
 TOTAL AREA (ACRES) = 4.68 PEAK FLOW RATE (CFS) = 8.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*****************
 FLOW PROCESS FROM NODE 21131.00 TO NODE 21132.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1450.00 DOWNSTREAM ELEVATION(FEET) = 1430.00
 STREET LENGTH (FEET) = 739.29 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 11.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 12.08
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.41
 STREET FLOW TRAVEL TIME (MIN.) = 3.49 Tc (MIN.) = 12.87
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.015
```

```
SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.65 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 4.65 SUBAREA RUNOFF(CFS) = 6.55
 EFFECTIVE AREA(ACRES) = 9.33 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 9.3 PEAK FLOW RATE (CFS) =
                                                        13.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 12.79
 FLOW VELOCITY (FEET/SEC.) = 3.60 DEPTH*VELOCITY (FT*FT/SEC.) = 1.49
 LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21132.00 = 1307.93 FEET.
*******************
 FLOW PROCESS FROM NODE 21232.00 TO NODE 21233.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 13 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1430.00 DOWNSTREAM ELEVATION(FEET) = 1423.00
 STREET LENGTH (FEET) = 666.66 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 32.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 18.58
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.52
   HALFSTREET FLOOD WIDTH (FEET) = 17.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.41
 STREET FLOW TRAVEL TIME (MIN.) = 4.06 Tc (MIN.) = 16.93
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.709
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 9.55 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.55 SUBAREA RUNOFF (CFS) = 10.83
 EFFECTIVE AREA(ACRES) = 18.88 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
```

Date: 04/21/2014 File name: LR0212ZZ.RES Page 27 Date: 04/21/2014 File name: LR0212ZZ.RES

Page 28

```
TOTAL AREA (ACRES) = 18.9 PEAK FLOW RATE (CFS) = 21.42
                                                                         FLOWDEPTH IN BOX IS 0.71 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 14.64
                                                                         BOX-FLOW(CFS) =
                                                                                          83.67
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 1.53 Tc (MIN.) = 18.46
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                         LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21234.00 = 5781.89 FEET.
                                                                        END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 18.99
                                                                         FLOW PROCESS FROM NODE 21234.00 TO NODE 21234.00 IS CODE = 81
 FLOW VELOCITY (FEET/SEC.) = 2.82 DEPTH*VELOCITY (FT*FT/SEC.) = 1.52
                                                                        ______
 LONGEST FLOWPATH FROM NODE 21230.00 TO NODE 21233.00 = 1974.59 FEET.
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        ______
*****************
                                                                         MAINLINE Tc (MIN.) = 18.46
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21233.00 IS CODE = 1
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.623
                                                                         SUBAREA LOSS RATE DATA (AMC II):
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fр
                                                                                                                   Aр
                                                                                                                           SCS
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                         RESIDENTIAL
 TOTAL NUMBER OF STREAMS = 2
                                                                         "3-4 DWELLINGS/ACRE" B 30.53 0.75 0.600
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                         SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TIME OF CONCENTRATION (MIN.) = 16.93
                                                                         SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 RAINFALL INTENSITY (INCH/HR) = 1.71
                                                                         SUBAREA AREA(ACRES) = 30.53
                                                                                                     SUBAREA RUNOFF (CFS) = 32.26
 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                         EFFECTIVE AREA(ACRES) = 107.89 AREA-AVERAGED Fm(INCH/HR) = 0.49
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                         AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.68
 AREA-AVERAGED Ap = 0.60
                                                                         TOTAL AREA(ACRES) = 125.2
                                                                                                      PEAK FLOW RATE(CFS) = 109.91
 EFFECTIVE STREAM AREA(ACRES) = 18.88
 TOTAL STREAM AREA(ACRES) = 18.88
                                                                         SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                         5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 21.42
 ** CONFLUENCE DATA **
                                                                         ** PEAK FLOW RATE TABLE **
  STREAM
          Q
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                          STREAM
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae
                                                                                                                          HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          NUMBER
                                                                                 (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          63.89 21.94 1.463 0.71(0.53)0.74 75.8 21220.00
                                                                          1 110.33 18.38 1.627 0.72(0.49) 0.68 107.9 21230.00
    2
          21.42 16.93 1.709 0.75 ( 0.45 ) 0.60 18.9 21230.00
                                                                           2 103.01 23.33 1.410 0.72(0.50) 0.69 125.2 21220.00
                                                                         NEW PEAK FLOW DATA ARE:
 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                         PEAK FLOW RATE (CFS) = 110.33 Tc (MIN.) = 18.38
 CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                         AREA-AVERAGED Fm (INCH/HR) = 0.49 AREA-AVERAGED Fp (INCH/HR) = 0.72
                                                                         AREA-AVERAGED Ap = 0.68 EFFECTIVE AREA(ACRES) = 107.89
 ** PEAK FLOW RATE TABLE **
                                                                        STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          FLOW PROCESS FROM NODE 21234.00 TO NODE 21235.00 IS CODE = 48
   1
          83.67 16.93 1.709 0.72(0.51) 0.71 77.4 21230.00
                                                                        ______
          81.12 21.94 1.463 0.72(0.51)0.71 94.7 21220.00
                                                                         >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                         >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                        ______
 PEAK FLOW RATE (CFS) = 83.67 Tc (MIN.) = 16.93
                                                                         ELEVATION DATA: UPSTREAM(FEET) = 1373.00 DOWNSTREAM(FEET) = 1359.00
 EFFECTIVE AREA(ACRES) = 77.36 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                         FLOW LENGTH (FEET) = 833.47 MANNING'S N = 0.014
 AREA-AVERAGED Fp(INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.71
                                                                         GIVEN BOX BASEWIDTH (FEET) = 15.00 GIVEN BOX HEIGHT (FEET) = 1.50
 TOTAL AREA (ACRES) =
                  94.7
                                                                         FLOWDEPTH IN BOX IS 0.71 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 10.32
 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21233.00 = 4438.54 FEET.
                                                                         BOX-FLOW(CFS) = 110.33
                                                                         BOX-FLOW TRAVEL TIME (MIN.) = 1.35 Tc (MIN.) = 19.72
******************
                                                                         LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21235.00 = 6615.36 FEET.
 FLOW PROCESS FROM NODE 21233.00 TO NODE 21234.00 IS CODE = 48
                                                                        >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
                                                                         FLOW PROCESS FROM NODE 21235.00 TO NODE 21235.00 IS CODE = 81
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
_____
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 ELEVATION DATA: UPSTREAM(FEET) = 1423.00 DOWNSTREAM(FEET) = 1373.00
                                                                        _______
 FLOW LENGTH (FEET) = 1343.35 MANNING'S N = 0.014
                                                                         MAINLINE Tc(MIN.) = 19.72
 GIVEN BOX BASEWIDTH (FEET) = 8.00 GIVEN BOX HEIGHT (FEET) = 1.50
                                                                         * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.560
      Date: 04/21/2014 File name: LR0212ZZ.RES
                                                                               Date: 04/21/2014
                                                 Page 29
                                                                                             File name: LR021277.RFS
                                                                                                                          Page 30
```

SUBAREA LOSS RATE DATA(AMC II):	3 145.67 26.31 1.312 0.75(0.49) 0.65 196.6 21200.00				
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS	4 118.55 34.33 1.118 0.75 (0.49) 0.65 209.2 21213.30				
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN MOBILE HOME PARK B 8.16 0.75 0.250 56	LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.				
RESIDENTIAL	** PEAK FLOW RATE TABLE **				
"3-4 DWELLINGS/ACRE" B 6.30 0.75 0.600 56	STREAM Q To Intensity Fp(Fm) Ap Ae HEADWATER				
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75	NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE				
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402	1 269.31 20.33 1.532 0.74(0.48) 0.65 280.8 21230.00				
SUBAREA AREA(ACRES) = 14.46 SUBAREA RUNOFF(CFS) = 16.38	2 265.99 23.51 1.404 0.74(0.48) 0.65 316.7 21213.10				
EFFECTIVE AREA (ACRES) = 122.35 AREA-AVERAGED Fm (INCH/HR) = 0.47	3 264.93 23.56 1.402 0.74 (0.48) 0.65 316.1 21210.00				
AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.64	4 259.37 25.24 1.345 0.74(0.48) 0.65 330.7 21220.00				
TOTAL AREA (ACRES) = 139.7 PEAK FLOW RATE (CFS) = 120.15	5 253.40 26.31 1.312 0.74(0.48) 0.65 336.2 21200.00 6 201.34 34.33 1.118 0.74(0.48) 0.65 348.9 21213.30				
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):	TOTAL AREA (ACRES) = 348.9				
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44	TOTAL INDIVIDUO 310.3				
	COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:				
** PEAK FLOW RATE TABLE **	PEAK FLOW RATE (CFS) = 269.31 Tc (MIN.) = 20.327				
STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER	EFFECTIVE AREA(ACRES) = 280.76 AREA-AVERAGED Fm(INCH/HR) = 0.48				
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.65				
1 120.51 19.65 1.563 0.73 (0.47) 0.64 122.4 21230.00	TOTAL AREA (ACRES) = 348.9				
2 112.00 24.58 1.367 0.72(0.48) 0.66 139.7 21220.00 NEW PEAK FLOW DATA ARE:	LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21236.00 = 10087.07 FEET.				
PEAK FLOW RATE (CFS) = 120.51 Tc (MIN.) = 19.65	******************				
AREA-AVERAGED Fm (INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.73	FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 12				
AREA-AVERAGED Ap = 0.64 EFFECTIVE AREA(ACRES) = 122.35					
	>>>>CLEAR MEMORY BANK # 1 <<<<				
*****************					
FLOW PROCESS FROM NODE 21235.00 TO NODE 21236.00 IS CODE = 48	*****************				
>>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<	FLOW PROCESS FROM NODE 21236.00 TO NODE 21246.00 IS CODE = 48				
>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<					
	>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA				
ELEVATION DATA: UPSTREAM(FEET) = 1359.00 DOWNSTREAM(FEET) = 1358.00	>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>				
FLOW LENGTH (FEET) = 230.02 MANNING'S N = 0.014					
GIVEN BOX BASEWIDTH (FEET) = 31.00 GIVEN BOX HEIGHT (FEET) = 1.50	ELEVATION DATA: UPSTREAM(FEET) = 1358.00 DOWNSTREAM(FEET) = 1311.00				
FLOWDEPTH IN BOX IS 0.71 FEET BOX-FLOW VELOCITY(FEET/SEC.) = 5.44  BOX-FLOW(CFS) = 120.51	FLOW LENGTH (FEET) = 1973.53 MANNING'S N = 0.014				
BOX-FLOW(CFS) = 120.51 BOX-FLOW TRAVEL TIME(MIN.) = 0.70 Tc(MIN.) = 20.36	GIVEN BOX BASEWIDTH(FEET) = 9.00 GIVEN BOX HEIGHT(FEET) = 4.00 FLOWDEPTH IN BOX IS 1.62 FEET BOX-FLOW VELOCITY(FEET/SEC.) = 18.45				
LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.	BOX-FLOW(CFS) = 269.31				
	BOX-FLOW TRAVEL TIME (MIN.) = 1.78 Tc (MIN.) = 22.11				
******************	LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21246.00 = 12060.60 FEET.				
FLOW PROCESS FROM NODE 21236.00 TO NODE 21236.00 IS CODE = 11					
ANNA CONTRACT ATMOST DAYS # 1 NATH THE WAYN OFFICE AND ATMOST	***************************************				
>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY	FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 81				
	>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<				
** MAIN STREAM CONFLUENCE DATA **					
STREAM Q TC Intensity Fp(Fm) Ap Ae HEADWATER					
NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	MAINLINE Tc(MIN.) = 22.11				
	MAINLINE Tc(MIN.) = 22.11 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00	MAINLINE Tc(MIN.) = 22.11 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456 SUBAREA LOSS RATE DATA(AMC II):				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00	MAINLINE TC(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.  ** MEMORY BANK # 1 CONFLUENCE DATA **	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.  ** MEMORY BANK # 1 CONFLUENCE DATA ** STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56  COMMERCIAL B 3.79 0.75 0.100 56				
1 120.51 20.33 1.532 0.73 (0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72 (0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.  ** MEMORY BANK # 1 CONFLUENCE DATA **  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE	MAINLINE TC (MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.456  SUBAREA LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56  COMMERCIAL B 3.79 0.75 0.100 56  MOBILE HOME PARK B 30.62 0.75 0.250 56				
1 120.51 20.33 1.532 0.73(0.47) 0.64 122.4 21230.00 2 112.00 25.24 1.345 0.72(0.48) 0.66 139.7 21220.00 LONGEST FLOWPATH FROM NODE 21220.00 TO NODE 21236.00 = 6845.38 FEET.  ** MEMORY BANK # 1 CONFLUENCE DATA ** STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 150.99 23.51 1.404 0.75(0.49) 0.65 183.2 21213.10	MAINLINE Tc(MIN.) = 22.11  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.456  SUBAREA LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 20.64 0.75 0.600 56  COMMERCIAL B 3.79 0.75 0.100 56  MOBILE HOME PARK B 30.62 0.75 0.250 56  PUBLIC PARK B 2.31 0.75 0.850 56				

 Date: 04/21/2014
 File name: LR0212ZZ.RES
 Page 31
 Date: 04/21/2014
 File name: LR0212ZZ.RES
 Page 32

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.390
                                                                              SUBAREA RUNOFF(CFS) = 10.97
 SUBAREA AREA (ACRES) = 57.36 SUBAREA RUNOFF (CFS) = 60.11
 EFFECTIVE AREA(ACRES) = 338.12 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 406.2 PEAK FLOW RATE (CFS) = 306.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 ** PEAK FLOW RATE TABLE **
  STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
    1
          308.05 22.02 1.460 0.74(0.45) 0.61 338.1 21230.00
          301.73 25.08 1.350 0.74(0.45) 0.61
                                              373.5 21210.00
          301.86 25.11 1.349 0.74(0.45) 0.61
                                              374.1 21213.10
          295.44 26.69 1.301 0.74(0.45) 0.62
                                               388.1 21220.00
          289.29 27.70 1.272 0.74(0.46) 0.62
                                               393.6 21200.00
          232.11 35.76 1.091 0.74(0.46) 0.62
                                               406.2 21213.30
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE (CFS) = 308.05 Tc (MIN.) = 22.02
 AREA-AVERAGED Fm (INCH/HR) = 0.45 AREA-AVERAGED Fp (INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.61 EFFECTIVE AREA(ACRES) = 338.12
*******************
 FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 22.02
 RAINFALL INTENSITY (INCH/HR) = 1.46
 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.74
 AREA-AVERAGED Ap = 0.61
 EFFECTIVE STREAM AREA(ACRES) = 338.12
 TOTAL STREAM AREA(ACRES) = 406.21
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 308.05
********************
 FLOW PROCESS FROM NODE 21240.00 TO NODE 21241.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 726.27
 ELEVATION DATA: UPSTREAM(FEET) = 1550.00 DOWNSTREAM(FEET) = 1518.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.728
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.247
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                             Aр
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 6.78
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                                   Date: 04/21/2014
```

```
TOTAL AREA(ACRES) = 6.78 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
************************
 FLOW PROCESS FROM NODE 21241.00 TO NODE 21242.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1518.00 DOWNSTREAM ELEVATION(FEET) = 1465.00
 STREET LENGTH (FEET) = 1349.95 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.78
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.44
  HALFSTREET FLOOD WIDTH (FEET) = 13.90
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.57
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.99
 STREET FLOW TRAVEL TIME (MIN.) = 4.92 Tc (MIN.) = 15.65
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.792
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
                                                αA
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 13.82
                                       0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 13.82 SUBAREA RUNOFF(CFS) = 16.70
 EFFECTIVE AREA(ACRES) = 20.60 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 20.6 PEAK FLOW RATE(CFS) = 24.89
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.47 HALFSTREET FLOOD WIDTH(FEET) = 15.42
 FLOW VELOCITY (FEET/SEC.) = 4.85 DEPTH*VELOCITY (FT*FT/SEC.) = 2.26
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21242.00 = 2076.22 FEET.
FLOW PROCESS FROM NODE 21242.00 TO NODE 21243.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
```

File name: LR021277.RFS

Page 34

```
UPSTREAM ELEVATION(FEET) = 1465.00 DOWNSTREAM ELEVATION(FEET) = 1420.00
 STREET LENGTH (FEET) = 1314.48 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.81
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.51
   HALFSTREET FLOOD WIDTH (FEET) = 17.59
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.50
 STREET FLOW TRAVEL TIME (MIN.) = 4.47 Tc (MIN.) = 20.12
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.541
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap
                                                       SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.61
                                        0.75 0.600 56
                    В
                              0.19
                                      0.75 0.100 56
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.594
 SUBAREA AREA(ACRES) = 14.80 SUBAREA RUNOFF(CFS) = 14.61
 EFFECTIVE AREA(ACRES) = 35.40 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) = 35.4 PEAK FLOW RATE (CFS) = 34.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.52 HALFSTREET FLOOD WIDTH(FEET) = 18.18
 FLOW VELOCITY (FEET/SEC.) = 4.99 DEPTH*VELOCITY (FT*FT/SEC.) = 2.60
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21243.00 = 3390.70 FEET.
*******************
 FLOW PROCESS FROM NODE 21243.00 TO NODE 21244.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1420.00 DOWNSTREAM ELEVATION(FEET) = 1372.00
 STREET LENGTH (FEET) = 1306.02 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.79
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                     40.98
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.54
   HALFSTREET FLOOD WIDTH (FEET) = 19.12
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.88
 STREET FLOW TRAVEL TIME (MIN.) = 4.08 Tc (MIN.) = 24.20
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.379
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.60 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 14.60 SUBAREA RUNOFF(CFS) = 12.23
 EFFECTIVE AREA (ACRES) = 50.00 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 50.0 PEAK FLOW RATE(CFS) = 41.94
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.54 HALFSTREET FLOOD WIDTH(FEET) = 19.29
 FLOW VELOCITY (FEET/SEC.) = 5.36 DEPTH*VELOCITY (FT*FT/SEC.) = 2.92
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21244.00 = 4696.72 FEET.
******************
 FLOW PROCESS FROM NODE 21244.00 TO NODE 21245.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1372.00 DOWNSTREAM ELEVATION(FEET) = 1330.00
 STREET LENGTH (FEET) = 1339.26 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
                                                     48.06
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
```

File name: LR0212ZZ.RES

Page 36

Date: 04/21/2014

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2

```
HALFSTREET FLOOD WIDTH (FEET) = 21.05
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                    B 2.70 0.75 0.600
                                                                               MOBILE HOME PARK B 4.66
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.20
                                                                                                                     0.75 0.250 56
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.01
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 STREET FLOW TRAVEL TIME (MIN.) = 4.29 Tc (MIN.) = 28.49
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.251
                                                                               SUBAREA AREA (ACRES) = 7.36 SUBAREA RUNOFF (CFS) = 5.85
                                                                               EFFECTIVE AREA(ACRES) = 74.32 AREA-AVERAGED Fm(INCH/HR) = 0.43
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.58
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                                                               TOTAL AREA (ACRES) = 74.3 PEAK FLOW RATE (CFS) =
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESTDENTIAL
 "3-4 DWELLINGS/ACRE"
                           11.63
                                       0.75 0.600
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                     В
                             5.33
                                     0.75 0.600 56
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
 SCHOOL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                               END OF SUBAREA STREET FLOW HYDRAULICS:
 SUBAREA AREA (ACRES) = 16.96 SUBAREA RUNOFF (CFS) = 12.24
                                                                               DEPTH(FEET) = 0.62 HALFSTREET FLOOD WIDTH(FEET) = 23.10
 EFFECTIVE AREA(ACRES) = 66.96 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                               FLOW VELOCITY (FEET/SEC.) = 4.45 DEPTH*VELOCITY (FT*FT/SEC.) = 2.76
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                                                                               LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21246.00 = 6975.71 FEET.
 TOTAL AREA (ACRES) = 67.0 PEAK FLOW RATE (CFS) =
                                                       48.39
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               FLOW PROCESS FROM NODE 21246.00 TO NODE 21246.00 IS CODE = 1
                                                                             ______
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                               >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 21.11
                                                                             ______
 FLOW VELOCITY (FEET/SEC.) = 5.21 DEPTH*VELOCITY (FT*FT/SEC.) = 3.02
                                                                               TOTAL NUMBER OF STREAMS = 2
 LONGEST FLOWPATH FROM NODE 21240.00 TO NODE 21245.00 = 6035.98 FEET.
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                               TIME OF CONCENTRATION (MIN.) = 31.98
*****
                                                                               RAINFALL INTENSITY (INCH/HR) = 1.17
 FLOW PROCESS FROM NODE 21245.00 TO NODE 21246.00 IS CODE = 63
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.43
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                               AREA-AVERAGED Ap = 0.58
 >>>> (STREET TABLE SECTION # 18 USED) <<<<
                                                                               EFFECTIVE STREAM AREA(ACRES) = 74.32
_____
                                                                               TOTAL STREAM AREA(ACRES) = 74.32
 UPSTREAM ELEVATION(FEET) = 1330.00 DOWNSTREAM ELEVATION(FEET) = 1311.00
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE =
 STREET LENGTH (FEET) = 939.73 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 26.00
                                                                               ** CONFLUENCE DATA **
                                                                                STREAM Q Tc Intensity Fp(Fm) Ap Ae
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 15.00
                                                                                NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR)
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                        308.05 22.02 1.460 0.74(0.45) 0.61 338.1 21230.00
                                                                                        301.73 25.08 1.350 0.74(0.45) 0.61
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                        301.86 25.11 1.349 0.74(0.45) 0.61
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                        295.44 26.69 1.301 0.74(0.45) 0.62
                                                                                        289.29 27.70 1.272 0.74(0.46) 0.62
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                  1
                                                                                        232.11 35.76
                                                                                                      1.091 0.74(0.46) 0.62
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                         49.19 31.98
                                                                                                      1.167 0.75(0.43) 0.58
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.92
                                                                               RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                               CONFLUENCE FORMULA USED FOR 2 STREAMS.
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                               ** PEAK FLOW RATE TABLE **
   STREET FLOW DEPTH(FEET) = 0.63
   HALFSTREET FLOOD WIDTH (FEET) = 23.51
                                                                                STREAM Q Tc Intensity Fp(Fm) Ap
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.49
                                                                                NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR)
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.82
                                                                                 1
                                                                                        355.41 22.02 1.460 0.74(0.45) 0.60
 STREET FLOW TRAVEL TIME (MIN.) = 3.49 Tc (MIN.) = 31.98
                                                                                        349.92 25.08 1.350 0.74(0.45) 0.61
                                                                                        350.05 25.11 1.349 0.74(0.45) 0.61
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.167
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                        343.96 26.69
                                                                                                     1.301 0.74(0.45) 0.61
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                        337.98 27.70
                                                                                                     1.272 0.74(0.45) 0.61
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                        308.10 31.98
                                                                                                     1.167 0.74(0.45)0.61
 RESIDENTIAL
                                                                                        276.25 35.76
                                                                                                      1.091 0.74(0.45) 0.61
```

Date: 04/21/2014

File name: LR0212ZZ.RES

Date: 04/21/2014 File name: LR0212ZZ.RES Page 38

49.19

HEADWATER

373.5 21210.00

374.1 21213.10

388.1 21220.00

393.6 21200.00

406.2 21213.30

74.3 21240.00

Ae HEADWATER

389.3 21230.00

431.8 21210.00

432.5 21213.10

450.1 21220.00

458.0 21200.00

474.6 21240.00

480.5 21213.30

(ACRES) NODE

(ACRES) NODE

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                      PEAK FLOW RATE (CFS) = 363.11 Tc (MIN.) = 23.20
 PEAK FLOW RATE (CFS) = 355.41 Tc (MIN.) = 22.02
                                                                      AREA-AVERAGED Fm(INCH/HR) = 0.45 AREA-AVERAGED Fp(INCH/HR) = 0.74
 EFFECTIVE AREA(ACRES) = 389.28 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                      AREA-AVERAGED Ap = 0.60 EFFECTIVE AREA(ACRES) =
 AREA-AVERAGED Fp (INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 480.5
                                                                    ******************
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21246.00 = 12060.60 FEET.
                                                                      FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 10
                                                                    ______
********************
                                                                      >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
 FLOW PROCESS FROM NODE 21246.00 TO NODE 21247.00 IS CODE = 48
______
                                                                     ******************
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <><<
                                                                      FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 15.1
_____
                                                                    ______
 ELEVATION DATA: UPSTREAM(FEET) = 1311.00 DOWNSTREAM(FEET) = 1290.00
                                                                      >>>>DEFINE MEMORY BANK # 2 <<<<<
 FLOW LENGTH (FEET) = 1258.84 MANNING'S N = 0.014
                                                                    ______
 GIVEN BOX BASEWIDTH (FEET) = 12.00 GIVEN BOX HEIGHT (FEET) = 4.00
                                                                      PEAK FLOWRATE TABLE FILE NAME: 21167.DNA
 FLOWDEPTH IN BOX IS 1.76 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 16.83
                                                                      MEMORY BANK # 2 DEFINED AS FOLLOWS:
 BOX-FLOW(CFS) = 355.41
                                                                      PEAK FLOW RATE (CFS) = 554.63 Tc (MIN.) = 33.08
 BOX-FLOW TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 23.26
                                                                      AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.61
 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21247.00 = 13319.44 FEET.
                                                                      TOTAL AREA(ACRES) = 741.4
                                                                      LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
******************
                                                                    *************************
 FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 81
______
                                                                      FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 14.0
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
                                                                      >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
 MAINLINE Tc(MIN.) = 23.26
                                                                    ______
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.412
 SUBAREA LOSS RATE DATA (AMC II):
                                                                      MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                      PEAK FLOW RATE (CFS) = 554.63 Tc (MIN.) = 33.08
                                                SCS
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                      AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.61
    LAND USE
 RESIDENTIAL
                                                                      TOTAL AREA (ACRES) = 741.4
 "3-4 DWELLINGS/ACRE" B 23.54
                                   0.75
                                          0.600 56
                                                                      LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21167.00 = 13765.49 FEET.
                          1.26
                                   0.75
                                          0.100 56
 COMMERCIAL
                   В
                                                                    ******************
 MOBILE HOME PARK
                     В
                           0.22
                                   0.75
                                          0.250
                                                56
 AGRICULTURAL FAIR COVER
                                                                      FLOW PROCESS FROM NODE 21167.00 TO NODE 21167.00 IS CODE = 12
 "ORCHARDS"
                     В
                          1.80
                                 0.63
                                        1.000 65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
                                                                      >>>>CLEAR MEMORY BANK # 2 <<<<
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                    _____
                        SUBAREA RUNOFF(CFS) = 23.44
 SUBAREA AREA(ACRES) = 26.82
 EFFECTIVE AREA(ACRES) = 416.10 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                     ******************
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.60
                                                                      FLOW PROCESS FROM NODE 21167.00 TO NODE 21147.00 IS CODE = 42
 TOTAL AREA(ACRES) = 507.4 PEAK FLOW RATE(CFS) =
                                                                      >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                      >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
                                                                    _____
                                                                      UPSTREAM NODE ELEVATION (FEET) = 1320.00
 ** PEAK FLOW RATE TABLE **
                                                                      DOWNSTREAM NODE ELEVATION (FEET) = 1290.00
  STREAM
               Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                      FLOW LENGTH (FEET) = 1357.45 MANNING'S N = 0.013
        0
  NUMBER
          (CFS) (MIN.) (INCH/HR) (INCH/HR)
                                         (ACRES) NODE
                                          416.1 21230.00
                                                                      USER SPECIFIED PIPE DIAMETER (INCH) = 90.00 NUMBER OF PIPES = 1
    1
         363.11 23.20 1.415 0.74(0.45) 0.60
         358.20 26.18
                     1.316 0.74(0.45) 0.61
                                           459.3 21213.10
                                                                      DEPTH OF FLOW IN 90.0 INCH PIPE IS 44.2 INCHES
         357.35 26.21
                     1.315 0.74(0.45) 0.61
                                           458.6 21210.00
                                                                      PIPE-FLOW VELOCITY (FEET/SEC.) = 25.65
         352.30 27.71
                     1.272 0.74(0.45) 0.61
                                           476.9 21220.00
                                                                      PIPE-FLOW(CFS) = 554.63
                     1.246 0.74(0.45) 0.61
         346.64 28.68
                                           484.8 21200.00
                                                                      *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
         313.63 32.94
                     1.146 0.74(0.45)0.61
                                           501.4 21240.00
                                                                      PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 33.97
         284.21 36.70 1.074 0.74(0.45) 0.61
                                           507.4 21213.30
                                                                      LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21147.00 = 15122.94 FEET.
```

NEW PEAK FLOW DATA ARE:

Date: 04/21/2014 File name: LR0212ZZ.RES Page 39 Date: 04/21/2014 File name: LR0212ZZ.RES Page 40

\* FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>> \_\_\_\_\_ MAINLINE Tc(MIN.) = 33.97\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.126 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fр Aр SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN MOBILE HOME PARK В 0.01 0.75 0.250 56 RESIDENTIAL 7.68 "3-4 DWELLINGS/ACRE" В 0.75 0.600 56 AGRICULTURAL FAIR COVER 2.53 0.63 1.000 "ORCHARDS" В SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.699 SUBAREA AREA(ACRES) = 10.22 UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.83;3H= 1.37;6H= 1.87;24H= 3.58 S-GRAPH: VALLEY (DEV.) = 92.2%; VALLEY (UNDEV.) / DESERT = 7.8% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.57; LAG(HR) = 0.45; Fm(INCH/HR) = 0.49; Ybar = 0.61 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 751.6 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3, n=.0368; Lca/L=0.4, n=.0330; Lca/L=0.5, n=.0303; Lca/L=0.6, n=.0282 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 98.12

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 551.29

TOTAL AREA (ACRES) = 751.6 PEAK FLOW RATE (CFS) = 554.63

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

\*

FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 11

>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY

\*\* MAIN STREAM CONFLUENCE DATA \*\*

PEAK FLOW RATE (CFS) = 554.63 Tc (MIN.) = 33.97

AREA-AVERAGED Fm (INCH/HR) = 0.49 Ybar = 0.61

TOTAL AREA(ACRES) = 751.6

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET.

\*\* MEMORY BANK # 1 CONFLUENCE DATA \*\*

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	363.11	23.20	1.415	0.74(0.45)	0.60	416.1	21230.00
2	358.20	26.18	1.316	0.74(0.45)	0.61	459.3	21213.10
3	357.35	26.21	1.315	0.74(0.45)	0.61	458.6	21210.00
4	352.30	27.71	1.272	0.74( 0.45)	0.61	476.9	21220.00

346.64 28.68 1.246 0.74(0.45) 0.61 484.8 21200.00 313.63 32.94 1.146 0.74(0.45) 0.61 501.4 21240.00 284.21 36.70 1.074 0.74(0.45) 0.61 507.4 21213.30 LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21247.00 = 13319.44 FEET. COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.82;3H= 1.35;6H= 1.85;24H= 3.52 S-GRAPH: VALLEY (DEV.) = 93.7%; VALLEY (UNDEV.) / DESERT= 6.3% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.57; LAG(HR) = 0.45; Fm(INCH/HR) = 0.48; Ybar = 0.59 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94; 3HR = 0.99; 6HR = 1.00; 24HR = 1.00UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1259.0 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21247.00 = 15122.94 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3, n=.0368; Lca/L=0.4, n=.0330; Lca/L=0.5, n=.0303; Lca/L=0.6, n=.0282 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 165.87 PEAK FLOW RATE (CFS) = 895.63\* FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 1 <<<< \_\_\_\_\_\_ \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21247.00 TO NODE 21248.00 IS CODE = 54 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW< >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) < \_\_\_\_\_\_ ELEVATION DATA: UPSTREAM(FEET) = 1290.00 DOWNSTREAM(FEET) = 1280.00 CHANNEL LENGTH THRU SUBAREA (FEET) = 452.82 CHANNEL SLOPE = 0.0221 CHANNEL BASE (FEET) = 9.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50 CHANNEL FLOW THRU SUBAREA(CFS) = 895.63 FLOW VELOCITY (FEET/SEC.) = 22.38 FLOW DEPTH (FEET) = 2.76 TRAVEL TIME (MIN.) = 0.34 Tc (MIN.) = 34.30LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET. \* FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_ MAINLINE Tc(MIN.) = 34.30\* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.119 SUBAREA LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA Fρ GROUP (ACRES) (INCH/HR) (DECIMAL) CN LAND USE MOBILE HOME PARK В 37.17 0.75 0.250 56 10.19 0.75 0.100 56 COMMERCIAL В RESIDENTIAL 34.08 "3-4 DWELLINGS/ACRE" В 0.75 0.600 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378 Date: 04/21/2014 File name: LR021277.RFS Page 42

```
SUBAREA AREA(ACRES) = 81.44
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.82;3H= 1.35;6H= 1.85;24H= 3.52
 S-GRAPH: VALLEY (DEV.) = 94.1%; VALLEY (UNDEV.) / DESERT= 5.9%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.46; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298; Lca/L=0.6,n=.0278
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 180.87
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 951.87
 TOTAL AREA (ACRES) = 1340.4 PEAK FLOW RATE (CFS) = 951.87
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44
*********************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 152
______
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE<
______
 PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
______
 END OF STUDY SUMMARY:
 TOTAL AREA (ACRES) = 1340.4 TC (MIN.) = 34.30
 AREA-AVERAGED Fm (INCH/HR) = 0.46 Ybar = 0.58
 PEAK FLOW RATE (CFS) = 951.87
______
______
```

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0212ZZ.RES Page 43 Date: 04/21/2014 File name: LR0212ZZ.RES Page 44

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
(Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
(c) Copyright 1983-2013 Advanced Engineering Software (aes)
Ver. 20.0 Release Date: 06/01/2013 License ID 1264

Analysis prepared by:

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21378

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0213ZZ.DAT

TIME/DATE OF STUDY: 08:02 10/28/2013

\_\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.8000

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

_	ODIC DDI	INDD DIREBI	decitore for coorday firsten into direction					10000
	HALF-	CROWN TO	STREET-CROSSFALL:	CURB	GUTTER-	-GEOMETI	RIES:	MANNING
	WIDTH	CROSSFALL	IN- / OUT-/PARK-	HEIGHT	WIDTH	LIP	HIKE	FACTOR
NO.	(FT)	(FT)	SIDE / SIDE/ WAY	(FT)	(FT)	(FT)	(FT)	(n)
===	=====	=======	===========	=====	=====	=====	=====	======
1	18.0	12.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
2	20.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
3	22.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
4	15.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
5	18.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
6	15.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
7	16.0	10.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
8	16.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
9	17.0	10.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
10	30.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
11	24.0	15.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180
12	24.0	15.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
13	32.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
14	39.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
15	36.0	20.0	0.020/0.020/0.020	0.67	2.00	0.0312	0.167	0.0180
16	12.5	5.0	0.020/0.020/0.020	0.50	1.50	0.0312	0.125	0.0180

17 20.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 18 26.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 19 52.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  1. Relative Flow-Depth = 0.20 FEET									
GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  1. Relative Flow-Depth = 0.20 fer = 1.00 (Top-of-Curb)  2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UESTEAM THISUTARY PIPE.*  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 * Tc USED "VALLEY UNDEVLOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED.  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***FACTION DATA: UPSTREAM(FEET) = 702.11  **ELEVATION DATA: UPSTREAM(FEET) = 706.500 DOWNSTREAM(FEET) = 1630.00  **TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]***0.20  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.75  **SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) (DECIMAL) CN (MIN.  **RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89  **O-5 0.600 56 10.39  **SUBAREA AVERAG		20 0	10 0	0 020/0 020/	0 020	0.50	1 50 0 031	2 0 125	0 0180
GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  1. Relative Flow-Depth = 0.20 fer = 1.00 (Top-of-Curb)  2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S)  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UESTEAM THISUTARY PIPE.*  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 * Tc USED "VALLEY UNDEVLOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED.  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***FACTION DATA: UPSTREAM(FEET) = 702.11  **ELEVATION DATA: UPSTREAM(FEET) = 706.500 DOWNSTREAM(FEET) = 1630.00  **TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]***0.20  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  **SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  ** 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.75  **SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) (DECIMAL) CN (MIN.  **RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  **RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 3.89  **O-5 0.600 56 10.39  **SUBAREA AVERAG		26.0	15.0	0.020/0.020/	0.020	0.67	2.00 0.031	2 0.167	0.0180
GLOBAL STREET FLOW-DEPTH CONSTRAINTS:  1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S) *SIZE FIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.* *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 * TC USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***TATIONAL METHOD INITIAL SUBAREA ANALYSIS<***  **SUBAREA TOMOBE 21300.00 TO NODE 21301.00 IS CODE = 21  ***SYNARATIONAL METHOD INITIAL SUBAREA ANALYSIS<***  INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]***0.20  SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 10.326 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FD AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. **RESIDENTIAL **2 DMELLINGS/ACRE** B 3.89 0.75 0.700 56 10.9  RESIDENTIAL **2 DMELLINGS/ACRE** B 1.29 0.75 0.600 56 10.3  SUBAREA AVERAGE PERVIOUS LOSS RATE, PP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS LOSS RATE,	1 9								
1. Relative Flow-Depth = 0.20 FEET as (Maximum Allowable Street Flow Depth) - (Top-of-Curb) 2. (Depth)*(Velocity) Constraint = 6.0 (FT*FT/S) *SIZE PIEE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.* *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS: WATERSHED LAG = 0.80 * Tc USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBARRA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************				,,					
WATERSHED LAG = 0.80 * TC USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	2 *SI OF	l. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T	ve Flow-D ximum All )*(Veloci WITH A FI O THE UPS	Depth = 0.20 Depth	FEET Flow Do t = 6. REATER ' RY PIPE	O (FT*FT THAN .*	/S)		
USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	UNI	IT-HYDROG	RAPH MODE	L SELECTIONS/	PARAMET:	ERS:			
1 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	V	WATERSHED	LAG = 0.	80 * Tc					
FOR DEVELOPMENTS OF 2 UNITS/ACRE AND MORE. PRECIPITATION DATA ENTERED ON SUBAREA BASIS. SIERRA MADRE DEPTH-AREA FACTORS USED. *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	Ţ	JSED "VAI	LEY UNDEV	ELOPED" S-GRA	PH FOR	DEVELOPM	ENTS OF		
PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  SIERRA MADRE DEPTH-AREA FACTORS USED.  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	1	l UNITS/A	CRE AND I	ESS; AND "VAL	LEY DEV	ELOPED"	S-GRAPH		
**SIERRA MADRE DEPTH-AREA FACTORS USED.  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD  ***********************************	Ε	FOR DEVEL	OPMENTS C	F 2 UNITS/ACR	E AND M	ORE.			
**************************************	E	PRECIPITA	TION DATA	ENTERED ON S	UBAREA 1	BASIS.			
FLOW PROCESS FROM NODE 21300.00 TO NODE 21301.00 IS CODE = 21  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< <>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<  INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.9  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
FLOW PROCESS FROM NODE 21300.00 TO NODE 21301.00 IS CODE = 21  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< <><> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<  INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.9  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	*ANT	FECEDENT	MOISTURE	CONDITION (AM	C) II A	SSUMED F	OR UNIT HYD	ROGRAPH	METHOD'
FLOW PROCESS FROM NODE 21300.00 TO NODE 21301.00 IS CODE = 21  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< <><> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<  INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.9  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
FLOW PROCESS FROM NODE 21300.00 TO NODE 21301.00 IS CODE = 21  >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< <><> >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<  INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.9  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS< >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA< INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11 ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.326 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299 SUBAREA TC AND LOSS RATE DATA (AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.30 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675 SUBAREA RUNOFF (CFS) = 8.37 TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	***	******	*****	******	*****	*****	*****	*****	*****
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<	FLO	OW PROCES	S FROM NO	DE 21300.00	TO NODE	21301.	00 IS CODE	= 21	
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<									
INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	>>>	>>>RATION	AL METHOD	INITIAL SUBA	REA ANA	LYSIS<<<	<<		
INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
INITIAL SUBAREA FLOW-LENGTH (FEET) = 702.11  ELEVATION DATA: UPSTREAM (FEET) = 1665.00 DOWNSTREAM (FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.31  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00  TC = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20  SUBAREA ANALYSIS USED MINIMUM TC(MIN.) = 10.326  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	TMT	מוזט זגדיים	ADEA ETON	ו_ז באוכתט / בכבת /	- 70	2 11			
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.326 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299 SUBAREA Tc AND LOSS RATE DATA(AMC II): DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20 ************************************							CUDEAN/BEEU	16	20 00
SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 10.326 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	ELLE	EVATION L	ATA: UPSI	REAM(FEET) =	1000.	JU DOWN	STREAM (FEET	) = 16	30.00
SUBAREA ANALYSIS USED MINIMUM TC (MIN.) = 10.326 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************									
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.299  SUBAREA TC AND LOSS RATE DATA(AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.30  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	Τс								
SUBAREA TC AND LOSS RATE DATA (AMC II):  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC  LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.  RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99  RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39  SUBAREA AVERAGE PERVIOUS LOSS RATE, FP (INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675  SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************		BAREA ANA	LYSIS USE				6		
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS TC LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99 RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.30 SUBAREA AVERAGE PERVIOUS LOSS RATE, FP(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, AP = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20 ************************************									
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN. RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.90 RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.30 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	*	10 YEAR	RAINFALL			2.299			
RESIDENTIAL  "2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99 RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE	10 YEAR BAREA Tc	RAINFALL AND LOSS	RATE DATA (AMC	II):				
"2 DWELLINGS/ACRE" B 3.89 0.75 0.700 56 10.99 RESIDENTIAL  "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.39 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE	10 YEAR BAREA TC EVELOPMEN	RAINFALL AND LOSS T TYPE/	RATE DATA (AMC SCS SOIL	II): AREA	Fp	Ap	SCS	Tc
RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE	10 YEAR BAREA TC EVELOPMEN	RAINFALL AND LOSS T TYPE/	RATE DATA (AMC SCS SOIL	II): AREA	Fp	Ap HR) (DECIM	SCS MAL) CN	Tc
RESIDENTIAL "3-4 DWELLINGS/ACRE" B 1.29 0.75 0.600 56 10.3 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE	10 YEAR BAREA TC EVELOPMEN LAND U	RAINFALL AND LOSS T TYPE/ SE	RATE DATA (AMC SCS SOIL	II): AREA	Fp	Ap HR) (DECIM	SCS (AL) CN	Tc (MIN.)
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL	RAINFALL AND LOSS T TYPE/ ISE	RATE DATA (AMC SCS SOIL GROUP	II): AREA (ACRES)	Fp (INCH/	HR) (DECIM	IAL) CN	(MIN.
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675  SUBAREA RUNOFF(CFS) = 8.37  TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING	RAINFALL AND LOSS IT TYPE/ ISE S/ACRE"	RATE DATA (AMC SCS SOIL GROUP	II): AREA (ACRES)	Fp (INCH/	HR) (DECIM	IAL) CN	(MIN.
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675 SUBAREA RUNOFF(CFS) = 8.37 TOTAL AREA(ACRES) = 5.18 PEAK FLOW RATE(CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE"	RATE DATA (AMC SCS SOIL GROUP B	II): AREA (ACRES) 3.89	Fp (INCH/	HR) (DECIM	(AL) CN 0 56	(MIN.)
SUBAREA RUNOFF (CFS) = 8.37  TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES "3-	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL -4 DWELLI	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE"	RATE DATA (AMC SCS SOIL GROUP B	II): AREA (ACRES) 3.89	Fp (INCH/	HR) (DECIM 75 0.70 75 0.60	(AL) CN 0 56	(MIN.
TOTAL AREA (ACRES) = 5.18 PEAK FLOW RATE (CFS) = 8.37  SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH): 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES "3- SUE	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BIDENTIAL 4 DWELLI BAREA AVE	RAINFALL AND LOSS IT TYPE/ ISE ISS/ACRE" INGS/ACRE" IRAGE PERV	RATE DATA (AMC SCS SOIL GROUP B B YIOUS LOSS RAT	II): AREA (ACRES) 3.89 1.29 E, Fp(II	Fp (INCH/ 0. 0. NCH/HR)	HR) (DECIM 75 0.70 75 0.60 = 0.75	(AL) CN 0 56	(MIN.
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES "3- SUE SUE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE	RAINFALL AND LOSS IT TYPE/ ISE ISS/ACRE" INGS/ACRE" IRAGE PERV	RATE DATA (AMC SCS SOIL GROUP B B YIOUS LOSS RAT YIOUS AREA FRA	II): AREA (ACRES) 3.89 1.29 E, Fp(II	Fp (INCH/ 0. 0. NCH/HR)	HR) (DECIM 75 0.70 75 0.60 = 0.75	(AL) CN 0 56	(MIN.
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES "3-SUE SUE SUE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA RUN	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV OFF (CFS)	RATE DATA (AMC SCS SOIL GROUP B FIGURE LOSS RAT FIGURE AREA FRA S.37	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION,	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.	HR) (DECIM 75 0.70 75 0.60 = 0.75 675	O 56	(MIN. 10.9
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20  ***********************************	* SUE DE RES "2 RES "3-SUE SUE SUE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA RUN	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV OFF (CFS)	RATE DATA (AMC SCS SOIL GROUP B FIGURE LOSS RAT FIGURE AREA FRA S.37	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION,	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.	HR) (DECIM 75 0.70 75 0.60 = 0.75 675	O 56	(MIN.
**************************************	* SUE DE RES "2 RES "3-SUE SUE SUE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA RUN	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV OFF (CFS)	RATE DATA (AMC SCS SOIL GROUP B FIGURE LOSS RAT FIGURE AREA FRA S.37	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION,	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.	HR) (DECIM 75 0.70 75 0.60 = 0.75 675	O 56	(MIN. 10.9
FLOW PROCESS FROM NODE 21301.00 TO NODE 21302.00 IS CODE = 63  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <>><  UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00  STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	* SUE DE RES "2 RES "3-SUE SUE SUE TOT	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BIDENTIAL 4 DWELLI BAREA AVE BAREA RUN FAL AREA (	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV IRAGE PERV IOFF(CFS) ACRES) =	RATE DATA (AMC SCS SOIL GROUP  B  YIOUS LOSS RAT YIOUS AREA FRA = 8.37 5.18 P	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION, EAK FLO	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE (C	HR) (DECIM 75 0.70 75 0.60 = 0.75 675	O 56	(MIN.
FLOW PROCESS FROM NODE 21301.00 TO NODE 21302.00 IS CODE = 63  >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA< >>>> (STREET TABLE SECTION # 5 USED) <>><  UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00  STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	* SUE DE RES "2 RES SUE SUE TOT	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BAREA AVE BAREA AVE BAREA RUN TAL AREA ( BAREA AREA	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV IRAGE	RATE DATA (AMC SCS SOIL GROUP  B FOR STATE OF ST	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION, A EAK FLOI	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE (C	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) =	(AL) CN 0 56 0 56 8.37	10.98 10.33
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 5 USED) <>>>  UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00  STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	* SUE DE RES "2 RES SUE SUE TOT	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BAREA AVE BAREA AVE BAREA RUN TAL AREA ( BAREA AREA	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV IRAGE	RATE DATA (AMC SCS SOIL GROUP  B FOR STATE OF ST	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION, A EAK FLOI	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE (C	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) =	(AL) CN 0 56 0 56 8.37	10.98 10.33
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<>>>>> (STREET TABLE SECTION # 5 USED) <>>>  UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00  STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	* SUE DE RES "2 RES SUE SUE TOT SUE 5M	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.30;	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV IOFF (CFS) ACRES) = IA-AVERAGE 30M = 0.6	RATE DATA (AMC SCS SOIL GROUP  B YIOUS LOSS RAT YIOUS AREA FRA = 8.37 5.18 P CD RAINFALL DE 51; 1HR = 0.80	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION, EAK FLOI PTH (INC.; 3HR =	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74;	(AL) CN 0 56 0 56 8.37 24HR = 3	(MIN.) 10.98 10.33
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA <ccc>&gt;&gt;&gt;&gt; (STREET TABLE SECTION # 5 USED) CCCC  UPSTREAM ELEVATION (FEET) = 1630.00 DOWNSTREAM ELEVATION (FEET) = 1627.00  STREET LENGTH (FEET) = 166.02 CURB HEIGHT (INCHES) = 6.0</ccc>	* SUE DE RES "2 RES SUE SUE SUE SUE SUE SUE SUE SUE SUE S	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.30;	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" IRAGE PERV IOFF (CFS) ACRES) = IA-AVERAGE 30M = 0.6	RATE DATA (AMC SCS SOIL GROUP  B YIOUS LOSS RAT YIOUS AREA FRA = 8.37 5.18 P CD RAINFALL DE 51; 1HR = 0.80	II): AREA (ACRES) 3.89 1.29 E, Fp(II) CTION, EAK FLOI PTH (INC: ; 3HR =	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; **********	(AL) CN 0 56 0 56 8.37 24HR = 3	(MIN.) 10.98 10.33
>>>> (STREET TABLE SECTION # 5 USED) <<<<	SUE DE RES "2 RES SUE SUE SUE TOT SUE 5M FLC	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL OWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA ARE = 0.30; ************************************	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS/INGS/INGS/INGS/INGS/INGS/INGS/INGS/	RATE DATA (AMC SCS SOIL GROUP  B YIOUS LOSS RAT YIOUS AREA FRA = 8.37 5.18 P CD RAINFALL DE 51; 1HR = 0.80	II): AREA (ACRES) 3.89 1.29 E, FP(I) CTION, EAK FLOI PTH(INC: ; 3HR = ******* TO NODE	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6 ******** 21302.	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	(MIN.) 10.98 10.33
UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00 STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	SUE DE RES "2 RES SUE SUE SUE SUE SUE TOT SUE SUE SUE TOT SUE	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING SIDENTIAL -4 DWELLI BAREA AVE BAREA AVE BAREA RUN FAL AREA( BAREA ARE = 0.30;	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS	RATE DATA (AMC SCS SOIL GROUP  B  YIOUS LOSS RAT YIOUS AREA FRA = 8.37 5.18 P  CD RAINFALL DE 51; 1HR = 0.80	II): AREA (ACRES) 3.89 1.29 E, FP(I) CTION, EAK FLOI PTH(INC. ; 3HR = ******* TO NODE	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6 ******** 21302.	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	(MIN.) 10.98 10.33
UPSTREAM ELEVATION(FEET) = 1630.00 DOWNSTREAM ELEVATION(FEET) = 1627.00 STREET LENGTH(FEET) = 166.02 CURB HEIGHT(INCHES) = 6.0	SUE RESS "3-SUE SUE TOT SUE 5M FLC	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BIDENTIAL 4 DWELLI BAREA AVE BAREA AVE BAREA ARE = 0.30;  ***********************************	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS/INGS/INGS/INGS/INGS/INGS/INGS/INGS/	RATE DATA (AMC SCS SOIL GROUP  B FIGUS LOSS RAT FIGUS AREA FRA = 8.37 5.18 P FIGURAL DE SI; 1HR = 0.80  STATE OF STATE O	II): AREA (ACRES) 3.89 1.29 E, FP(II CTION, EAK FLOI PTH(INC. ; 3HR = ******* TO NODE IME THRI	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6 ******** 21302. U SUBARE	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	(MIN.) 10.98 10.33
STREET LENGTH (FEET) = 166.02 CURB HEIGHT (INCHES) = 6.0	* SUE DE RES "2 RES SUE SUE TOT SUE 5M ****	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL 4 DWELLI BAREA AVE BAREA AVE BAREA ARE = 0.30;  ********** DW PROCES	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS/INGS/INGS/INGS/INGS/INGS/INGS/INGS/	RATE DATA (AMC SCS SOIL GROUP  B FIGUS LOSS RAT FIGUS AREA FRA = 8.37 5.18 P FIGUS RAINFALL DE FIGURAL DE FIGU	II): AREA (ACRES)  3.89  1.29 E, Fp(II CTION, I EAK FLOI PTH (INC. ; 3HR =  ****** TO NODE IME THRI SED) <<<	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6 ******** 21302.  U SUBARE	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************ 00 IS CODE	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	.20
	* SUE DE RES "2 RES SUE SUE TOT SUE 5M ****	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL 4 DWELLI BAREA AVE BAREA AVE BAREA ARE = 0.30;  ********** DW PROCES	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS/INGS/INGS/INGS/INGS/INGS/INGS/INGS/	RATE DATA (AMC SCS SOIL GROUP  B FIGUS LOSS RAT FIGUS AREA FRA = 8.37 5.18 P FIGUS RAINFALL DE FIGURAL DE FIGU	II): AREA (ACRES)  3.89  1.29 E, Fp(II CTION, I EAK FLOI PTH (INC. ; 3HR =  ****** TO NODE IME THRI SED) <<<	Fp (INCH/ 0. 0. NCH/HR) Ap = 0. W RATE (C H): 1.29; 6 ******** 21302.  U SUBARE	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************ 00 IS CODE	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	.20
	* SUE DE	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING SIDENTIAL 4 DWELLI BAREA AVE BAREA AVE BAREA ARE = 0.30;  ********** DW PROCES	RAINFALL AND LOSS IT TYPE/ ISE IS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRE" INGS/ACRES INGS	RATE DATA (AMC SCS SOIL GROUP  B  FIOUS LOSS RAT FIOUS AREA FRA 8.37 5.18 P  CD RAINFALL DE 51; 1HR = 0.80  **********************************	II): AREA (ACRES)  3.89  1.29 E, Fp(II) CTION, EAK FLOO  PTH (INC. ; 3HR =  ******* TO NODE IME THRI SED) <<<==================================	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE (C  H):  1.29; 6  *******  21302.  U SUBARE  <<========	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************* 00 IS CODE	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63	.20
CILDEL MIDINIPHI (LDDI) 10.00	* SUE DE RES "2 RES SUE SUE TOT SUE 5M **** FLC SUE 5M	10 YEAR BAREA TC EVELOPMEN LAND U BIDENTIAL DWELLING BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.30;  ********* DW PROCES >>>COMPUT >>> (STREE ETREAM EL	RAINFALL AND LOSS IT TYPE/ SE SS/ACRE" RAGE PERV RAGE PERV RAGE PERV ACRES) = A-AVERAGE 30M = 0.6 ************************************	RATE DATA (AMC SCS SOIL GROUP  B  TOUS LOSS RAT TOUS AREA FRA = 8.37 5.18 P  CD RAINFALL DE 51; 1HR = 0.80  **********************************	II): AREA (ACRES)  3.89  1.29 E, Fp(II CTION, I EAK FLOI PTH(INC: ; 3HR =  ******* TO NODE IME THR: SED) <<<:=======0 0 DOWN.	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE(C  H):  1.29; 6  ********  21302.  U SUBARE  <  STREAM E	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63 ET) = 16	.20
	* SUE DE RES "2 RES SUE TOT SUE 5M FLC SUE 5	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING BAREA AVE BAREA AVE BAREA RUN TAL AREA( BAREA ARE = 0.30;  ********* DW PROCES	RAINFALL AND LOSS IT TYPE/ SE SS/ACRE" RAGE PERV RAGE PERV OFF(CFS) ACRES) = A-AVERAGE 30M = 0.6 ********** The street of the st	RATE DATA (AMC SCS SOIL GROUP  B  TOUS LOSS RAT TOUS AREA FRA = 8.37 5.18 P  CD RAINFALL DE 51; 1HR = 0.80  **********************************	II): AREA (ACRES)  3.89  1.29 E, Fp(II CTION, I EAK FLOI PTH(INC: ; 3HR =  ******* TO NODE IME THR: SED) <<<:=======0 0 DOWN.	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE(C  H):  1.29; 6  ********  21302.  U SUBARE  <  STREAM E	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63 ET) = 16	.20
	* SUE DE RES "2 RES SUE SUE SUE SUE SUE SUE SUE SUE SUE S	10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL DWELLING BAREA AVE BAREA AVE BAREA RUN TAL AREA( BAREA ARE = 0.30;  ********* DW PROCES	RAINFALL AND LOSS IT TYPE/ SE SS/ACRE" RAGE PERV RAGE PERV OFF(CFS) ACRES) = A-AVERAGE 30M = 0.6 ********** The street of the st	RATE DATA (AMC SCS SOIL GROUP  B  TOUS LOSS RAT TOUS AREA FRA = 8.37 5.18 P  CD RAINFALL DE 51; 1HR = 0.80  **********************************	II): AREA (ACRES)  3.89  1.29 E, Fp(II CTION, I EAK FLOI PTH(INC: ; 3HR =  ******* TO NODE IME THR: SED) <<<:=======0 0 DOWN.	Fp (INCH/  0.  0.  NCH/HR)  Ap = 0.  W RATE(C  H):  1.29; 6  ********  21302.  U SUBARE  <  STREAM E	HR) (DECIM 75 0.70 75 0.60 = 0.75 675 FS) = HR = 1.74; ************************************	(AL) CN 0 56 0 56 8.37 24HR = 3 ******* = 63 ET) = 16	(MIN. 10.9 10.3 20 ******

Date: 04/21/2014 File name: LR0213ZZ.RES Page 1 Date: 04/21/2014 File name: LR0213ZZ.RES Page 2

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.38
   HALFSTREET FLOOD WIDTH (FEET) = 12.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.10
 STREET FLOW TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 11.29
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.180
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                         SCS
                                      Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                      B 2.06 0.75 0.700 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.29 0.75
                                                0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.688
 SUBAREA AREA(ACRES) = 2.35 SUBAREA RUNOFF(CFS) = 3.52
 EFFECTIVE AREA(ACRES) = 7.53 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 7.5 PEAK FLOW RATE (CFS) = 11.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.39 HALFSTREET FLOOD WIDTH(FEET) = 13.35
 FLOW VELOCITY (FEET/SEC.) = 2.98 DEPTH*VELOCITY (FT*FT/SEC.) = 1.17
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21302.00 = 868.13 FEET.
******************
 FLOW PROCESS FROM NODE 21302.00 TO NODE 21303.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1627.00 DOWNSTREAM ELEVATION(FEET) = 1623.00
 STREET LENGTH (FEET) = 202.20 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
```

```
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 12.93
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.90
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.15
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.28
 STREET FLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 12.35
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.065
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     B 1.93 0.75 0.700
                                                        56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.36 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.684
 SUBAREA AREA (ACRES) = 2.29 SUBAREA RUNOFF (CFS) = 3.20
 EFFECTIVE AREA(ACRES) = 9.82 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 9.8 PEAK FLOW RATE (CFS) = 13.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41 HALFSTREET FLOOD WIDTH(FEET) = 14.21
 FLOW VELOCITY (FEET/SEC.) = 3.22 DEPTH*VELOCITY (FT*FT/SEC.) = 1.32
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21303.00 = 1070.33 FEET.
*****************
 FLOW PROCESS FROM NODE 21303.00 TO NODE 21304.00 IS CODE = 63
_____
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1623.00 DOWNSTREAM ELEVATION(FEET) = 1600.00
 STREET LENGTH (FEET) = 190.38 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.56
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 15.00
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.33
   HALFSTREET FLOOD WIDTH (FEET) = 10.15
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.53
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 4

```
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.15
                                                                                RESIDENTIAL
 STREET FLOW TRAVEL TIME (MIN.) = 0.49 Tc (MIN.) = 12.84
                                                                                "2 DWELLINGS/ACRE"
                                                                                                  B 3.59 0.75 0.700 56
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.018
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.682
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                SUBAREA AREA (ACRES) = 4.39 SUBAREA RUNOFF (CFS) = 5.68
                                       Fρ
                                                Αp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                EFFECTIVE AREA(ACRES) = 16.04 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 1.38
                                        0.75
                                                0.700
                                                                                TOTAL AREA (ACRES) = 16.0 PEAK FLOW RATE (CFS) =
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.45 0.75 0.600
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.675
 SUBAREA AREA (ACRES) = 1.83 SUBAREA RUNOFF (CFS) = 2.49
                                                                                END OF SUBAREA STREET FLOW HYDRAULICS:
 EFFECTIVE AREA(ACRES) = 11.65 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                                DEPTH(FEET) = 0.38 HALFSTREET FLOOD WIDTH(FEET) = 12.80
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
                                                                                FLOW VELOCITY (FEET/SEC.) = 5.91 DEPTH*VELOCITY (FT*FT/SEC.) = 2.26
 TOTAL AREA (ACRES) = 11.6 PEAK FLOW RATE (CFS) = 15.83
                                                                                LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21305.00 = 1528.16 FEET.
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                                FLOW PROCESS FROM NODE 21305.00 TO NODE 21306.00 IS CODE = 63
                                                                               ______
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 DEPTH(FEET) = 0.33 HALFSTREET FLOOD WIDTH(FEET) = 10.38
                                                                                >>>> (STREET TABLE SECTION # 5 USED) <<<<
 FLOW VELOCITY (FEET/SEC.) = 6.62 DEPTH*VELOCITY (FT*FT/SEC.) = 2.21
                                                                              _____
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21304.00 = 1260.71 FEET.
                                                                                UPSTREAM ELEVATION(FEET) = 1580.00 DOWNSTREAM ELEVATION(FEET) = 1555.00
                                                                                STREET LENGTH (FEET) = 439.49 CURB HEIGHT (INCHES) = 6.0
******************
                                                                                STREET HALFWIDTH (FEET) = 18.00
 FLOW PROCESS FROM NODE 21304.00 TO NODE 21305.00 IS CODE = 63
______
                                                                                DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
                                                                                INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1600.00 DOWNSTREAM ELEVATION(FEET) = 1580.00
                                                                                SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET LENGTH (FEET) = 267.45 CURB HEIGHT (INCHES) = 6.0
                                                                                STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 STREET HALFWIDTH (FEET) = 18.00
                                                                                Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 27.56
                                                                                  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                  STREET FLOW DEPTH (FEET) = 0.43
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
                                                                                  HALFSTREET FLOOD WIDTH (FEET) = 15.23
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.66
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.44
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.63
                                                                                STREET FLOW TRAVEL TIME (MIN.) = 1.29 Tc (MIN.) = 14.91
                                                                                * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.845
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                SUBAREA LOSS RATE DATA (AMC II):
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                    Fp
   STREET FLOW DEPTH (FEET) = 0.37
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                    LAND USE
   HALFSTREET FLOOD WIDTH (FEET) = 12.26
                                                                                RESIDENTIAL
                                                                                "2 DWELLINGS/ACRE"
                                                                                                     В 8.99
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.14
                                                                                RESIDENTIAL
                                                                                "3-4 DWELLINGS/ACRE" B 2.29 0.75 0.600
 STREET FLOW TRAVEL TIME (MIN.) = 0.77 Tc (MIN.) = 13.61
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.948
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.680
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
                                                       SCS
                                                                                SUBAREA AREA (ACRES) = 11.28 SUBAREA RUNOFF (CFS) = 13.57
                                                                                EFFECTIVE AREA(ACRES) = 27.32 AREA-AVERAGED Fm(INCH/HR) = 0.51
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                                AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 "3-4 DWELLINGS/ACRE" B
                               0.80
                                        0.75
                                                0.600 56
                                                                                TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) = 32.85
```

Date: 04/21/2014

File name: LR0213ZZ.RES

Date: 04/21/2014 File name: LR0213ZZ.RES Page 6

20.78

SCS

56

0.75

0.700

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.45 HALFSTREET FLOOD WIDTH(FEET) = 16.32
 FLOW VELOCITY (FEET/SEC.) = 5.90 DEPTH*VELOCITY (FT*FT/SEC.) = 2.67
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21306.00 = 1967.65 FEET.
************************
 FLOW PROCESS FROM NODE 21306.00 TO NODE 21307.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1555.00 DOWNSTREAM ELEVATION(FEET) = 1530.00
 STREET LENGTH (FEET) = 430.58 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.67
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 41.34
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.73
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 6.34
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.05
 STREET FLOW TRAVEL TIME (MIN.) = 1.13 Tc (MIN.) = 16.04
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.765
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                                αA
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.82 0.75 0.600 56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                       В 11.14
                                       0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA (ACRES) = 14.96 SUBAREA RUNOFF (CFS) = 16.98
 EFFECTIVE AREA(ACRES) = 42.28 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 42.3 PEAK FLOW RATE (CFS) = 47.88
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 6.67 DEPTH*VELOCITY (FT*FT/SEC.) = 3.33
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21307.00 = 2398.23 FEET.
```

```
FLOW PROCESS FROM NODE 21307.00 TO NODE 21308.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1520.00
 STREET LENGTH (FEET) = 417.62 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.86
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                      53.34
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.58
   HALFSTREET FLOOD WIDTH (FEET) = 21.80
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.21
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.00
 STREET FLOW TRAVEL TIME (MIN.) = 1.34 Tc (MIN.) = 17.38
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.683
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fр
      LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.69 0.75 0.600
                                                           56
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 6.54 0.75 0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.664
 SUBAREA AREA (ACRES) = 10.23 SUBAREA RUNOFF (CFS) = 10.92
 EFFECTIVE AREA(ACRES) = 52.51 AREA-AVERAGED Fm(INCH/HR) = 0.51
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.68
 TOTAL AREA (ACRES) = 52.5 PEAK FLOW RATE (CFS) = 55.65
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58 HALFSTREET FLOOD WIDTH(FEET) = 22.16
 FLOW VELOCITY (FEET/SEC.) = 5.27 DEPTH*VELOCITY (FT*FT/SEC.) = 3.07
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21308.00 = 2815.85 FEET.
******************
 FLOW PROCESS FROM NODE 21308.00 TO NODE 21309.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
>>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 8

\*

```
UPSTREAM NODE ELEVATION (FEET) = 1520.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1445.00
 FLOW LENGTH (FEET) = 2140.63 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 16.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.16
 PIPE-FLOW(CFS) = 55.65
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 2.08 Tc (MIN.) = 19.46
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21309.00 = 4956.48 FEET.
*****
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21309.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 19.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.572
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                    SCS
                                   Fρ
                                            Αp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 52.35 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 52.35
                             SUBAREA RUNOFF (CFS) = 52.93
 EFFECTIVE AREA(ACRES) = 104.86 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA(ACRES) = 104.9 PEAK FLOW RATE(CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
*******************
 FLOW PROCESS FROM NODE 21309.00 TO NODE 21310.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1445.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1415.00
 FLOW LENGTH (FEET) = 762.02 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 20.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 20.92
 PIPE-FLOW(CFS) = 103.37
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.61 Tc (MIN.) = 20.06
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21310.00 = 5718.50 FEET.
******************
 FLOW PROCESS FROM NODE 21310.00 TO NODE 21310.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 20.06
```

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.544
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 18.20 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 18.20 SUBAREA RUNOFF (CFS) = 17.93
 EFFECTIVE AREA(ACRES) = 123.06 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 123.1 PEAK FLOW RATE (CFS) =
                                                 118.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21310.00 TO NODE 21311.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1415.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1356.00
 FLOW LENGTH (FEET) = 1371.34 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 21.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 22.39
 PIPE-FLOW(CFS) = 118.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.02 Tc (MIN.) = 21.08
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21311.00 = 7089.84 FEET.
*************************
 FLOW PROCESS FROM NODE 21311.00 TO NODE 21311.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 21.08
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.498
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                             Aρ
                                                    SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 19.39
                                      0.75 0.600
                                                    56
                     B 10.62 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 30.01 SUBAREA RUNOFF(CFS) = 28.35
 EFFECTIVE AREA(ACRES) = 153.07 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 153.1 PEAK FLOW RATE (CFS) = 141.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 9 Date: 04/21/2014 File name: LR0213ZZ.RES Page 10

```
FLOW PROCESS FROM NODE 21311.00 TO NODE 21312.00 IS CODE = 42
                                                                            FLOW PROCESS FROM NODE 21313.00 TO NODE 21313.00 IS CODE = 81
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          ______
_____
 UPSTREAM NODE ELEVATION (FEET) = 1356.00
                                                                           MAINLINE Tc (MIN.) = 22.72
 DOWNSTREAM NODE ELEVATION (FEET) = 1310.00
                                                                            * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.433
 FLOW LENGTH (FEET) = 1393.37 MANNING'S N = 0.013
                                                                           SUBAREA LOSS RATE DATA (AMC II):
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                               Fρ
                                                                                                                              SCS
 USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
                                                                               LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 DEPTH OF FLOW IN 51.0 INCH PIPE IS 24.4 INCHES
                                                                           RESIDENTIAL
 PIPE-FLOW VELOCITY (FEET/SEC.) = 21.21
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                               B 10.40 0.75 0.600
 PIPE-FLOW(CFS) = 141.92
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 PIPEFLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 22.18
                                                                           SUBAREA AREA(ACRES) = 10.40
                                                                                                       SUBAREA RUNOFF (CFS) = 9.21
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21312.00 = 8483.21 FEET.
                                                                           EFFECTIVE AREA(ACRES) = 246.35 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
TOTAL AREA (ACRES) =
                                                                                             246.3
                                                                                                         PEAK FLOW RATE(CFS) =
                                                                                                                              215.46
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21312.00 IS CODE = 81
______
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
                                                                          ******************
 MAINLINE Tc(MIN.) = 22.18
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.453
                                                                           FLOW PROCESS FROM NODE 21313.00 TO NODE 21360.00 IS CODE = 48
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                           Ар
                                                   SCS
                                                                           >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                           >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
 RESIDENTIAL
                                                                          _____
 "3-4 DWELLINGS/ACRE"
                            77.43
                                      0.75
                                             0.600 56
                   В
                                                                           ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1255.00
 SCHOOL
                      B
                             5.45
                                      0.75
                                             0.600 56
                                                                           FLOW LENGTH (FEET) = 1079.23 MANNING'S N = 0.014
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                           GIVEN BOX BASEWIDTH (FEET) = 6.00 GIVEN BOX HEIGHT (FEET) = 5.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                           FLOWDEPTH IN BOX IS 1.85 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 19.40
 SUBAREA AREA(ACRES) = 82.88
                          SUBAREA RUNOFF(CFS) = 74.94
                                                                           BOX-FLOW(CFS) = 215.46
 EFFECTIVE AREA(ACRES) = 235.95 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                           BOX-FLOW TRAVEL TIME (MIN.) = 0.93 Tc (MIN.) = 23.65
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
                                                                           LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
 TOTAL AREA(ACRES) = 235.9 PEAK FLOW RATE(CFS) =
                                                                          *********************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                            FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                          ______
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
******************
                                                                          _____
                                                                           MAINLINE Tc(MIN.) = 23.65
 FLOW PROCESS FROM NODE 21312.00 TO NODE 21313.00 IS CODE = 42
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.399
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                            DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fр
                                                                                                                      Aр
                                                                                                                              SCS
______
                                                                               LAND USE
                                                                                             GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 UPSTREAM NODE ELEVATION (FEET) = 1310.00
                                                                           RESIDENTIAL
 DOWNSTREAM NODE ELEVATION (FEET) = 1285.00
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                                                0.75
                                                                                                                       0.600
                                                                                                 В
                                                                                                     4.55
 FLOW LENGTH (FEET) = 759.92 MANNING'S N = 0.013
                                                                           MOBILE HOME PARK
                                                                                                В
                                                                                                        1.01
                                                                                                                0.75
                                                                                                                       0.250
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.536
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 28.1 INCHES
                                                                           SUBAREA AREA(ACRES) = 5.56
                                                                                                       SUBAREA RUNOFF(CFS) = 4.99
 PIPE-FLOW VELOCITY(FEET/SEC.) = 23.37
                                                                           EFFECTIVE AREA(ACRES) = 251.91 AREA-AVERAGED Fm(INCH/HR) = 0.46
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 PIPE-FLOW(CFS) = 210.69
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                           TOTAL AREA (ACRES) = 251.9 PEAK FLOW RATE (CFS) =
                                                                                                                            215.46
 PIPEFLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 22.72
                                                                           NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21313.00 = 9243.13 FEET.
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR021377.RFS Page 11 File name: LR0213ZZ.RES

Date: 04/21/2014

56

Page 12

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
FLOW PROCESS FROM NODE 21320.00 TO NODE 21321.00 IS CODE = 21
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 911.31
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1450.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.841
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.233
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                            Αp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.00
                                  0.75
                                           0.600
                                                 56 10.84
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF (CFS) = 11.24
 TOTAL AREA (ACRES) = 7.00 PEAK FLOW RATE (CFS) = 11.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21321.00 TO NODE 21322.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1450.00 DOWNSTREAM(FEET) = 1420.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 725.48 CHANNEL SLOPE = 0.0414
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                            11.24
 FLOW VELOCITY (FEET/SEC.) = 2.03 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 5.96 Tc (MIN.) = 16.80
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21322.00 = 1636.79 FEET.
FLOW PROCESS FROM NODE 21322.00 TO NODE 21322.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 16.80
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.717
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                 Fp
                                                 SCS
                                          Дp
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
```

```
"3-4 DWELLINGS/ACRE" B 9.15 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 9.15 SUBAREA RUNOFF (CFS) = 10.45
 EFFECTIVE AREA(ACRES) = 16.15 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                  16.1
                              PEAK FLOW RATE(CFS) =
                                                   18.44
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21322.00 TO NODE 21332.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1420.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
 FLOW LENGTH (FEET) = 1402.23 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 8.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.97
 PIPE-FLOW(CFS) =
                 18 44
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.67 Tc (MIN.) = 18.47
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 18.47
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.622
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                            αA
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                           9.34 0.75 0.600
 "3-4 DWELLINGS/ACRE" B
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 9.34
                            SUBAREA RUNOFF (CFS) = 9.86
 EFFECTIVE AREA(ACRES) = 25.49 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA(ACRES) = 25.5 PEAK FLOW RATE(CFS) =
                                                   26.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
TOTAL NUMBER OF STREAMS = 2
```

Date: 04/21/2014

RESIDENTIAL.

Date: 04/21/2014 File name: LR0213ZZ.RES Page 13

File name: LR0213ZZ.RES Page 14

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 TIME OF CONCENTRATION (MIN.) = 18.47
                                                                               SUBAREA AREA (ACRES) = 22.89 SUBAREA RUNOFF (CFS) = 27.70
 RAINFALL INTENSITY (INCH/HR) = 1.62
                                                                               EFFECTIVE AREA(ACRES) = 32.56 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fm(INCH/HR) = 0.45
                                                                               AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                               TOTAL AREA (ACRES) = 32.6 PEAK FLOW RATE (CFS) =
                                                                                                                                   39.40
 AREA-AVERAGED Ap = 0.60
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 EFFECTIVE STREAM AREA(ACRES) = 25.49
 TOTAL STREAM AREA(ACRES) = 25.49
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                 26.92
                                                                               STREET CROSS-SECTION INFORMATION:
******************
                                                                               CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
                                                                               DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 FLOW PROCESS FROM NODE 21330.00 TO NODE 21331.00 IS CODE = 21
                                                                               INSIDE STREET CROSSFALL (DECIMAL) = 0.020
                                                                               OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                               SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
______
                                                                               MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 870.87
                                                                               STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 ELEVATION DATA: UPSTREAM(FEET) = 1440.00 DOWNSTREAM(FEET) = 1425.00
                                                                               Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                               Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                               STREETFLOW HYDRAULICS BASED ON MAINLINE TC :
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 13.920
                                                                               STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 26.58
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.922
                                                                                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
 SUBAREA To AND LOSS RATE DATA(AMC II):
                                                                                STREET FLOW DEPTH (FEET) = 0.43
                                              Ap SCS Tc
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
                                                                                HALFSTREET FLOOD WIDTH (FEET) = 15.15
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                                AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.51
 RESIDENTIAL
                                                                                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.36
 "3-4 DWELLINGS/ACRE" B
                            9.67 0.75 0.600 56 13.92
                                                                               LONGEST FLOWPATH FROM NODE 21330.00 TO NODE 21332.00 = 2157.22 FEET.
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                             *******************
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA RUNOFF(CFS) = 12.82
                                                                               FLOW PROCESS FROM NODE 21332.00 TO NODE 21332.00 IS CODE = 1
 TOTAL AREA (ACRES) = 9.67 PEAK FLOW RATE (CFS) = 12.82
                                                                             ______
                                                                               >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                               >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                             ______
                                                                               TOTAL NUMBER OF STREAMS = 2
*****************
                                                                               CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 FLOW PROCESS FROM NODE 21331.00 TO NODE 21332.00 IS CODE = 33
                                                                               TIME OF CONCENTRATION (MIN.) = 15.63
                                                                               RAINFALL INTENSITY (INCH/HR) = 1.79
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
                                                                               AREA-AVERAGED Fm(INCH/HR) = 0.45
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                               AREA-AVERAGED Fp(INCH/HR) = 0.75
______
                                                                               AREA-AVERAGED Ap = 0.60
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
                                                                               EFFECTIVE STREAM AREA(ACRES) = 32.56
 DOWNSTREAM NODE ELEVATION (FEET) = 1355.00
                                                                               TOTAL STREAM AREA(ACRES) = 32.56
 FLOW LENGTH (FEET) = 1286.35 MANNING'S N = 0.013
                                                                               PEAK FLOW RATE (CFS) AT CONFLUENCE = 39.40
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                               ** CONFLUENCE DATA **
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 7.0 INCHES
                                                                               STREAM Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                               NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 13.30
 PIPE-FLOW(CFS) =
                 12.82
                                                                                1
                                                                                         26.92 18.47 1.622 0.75(0.45) 0.60 25.5 21320.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                         39.40 15.63 1.793 0.75(0.45) 0.60 32.6 21330.00
 PIPEFLOW TRAVEL TIME (MIN.) = 1.71 Tc (MIN.) = 15.63
                                                                               RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.793
 SUBAREA LOSS RATE DATA(AMC II):
                                                                               CONFLUENCE FORMULA USED FOR 2 STREAMS.
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                      SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               ** PEAK FLOW RATE TABLE **
 RESIDENTIAL
                                                                               STREAM O To Intensity Fp(Fm) Ap Ae
                                                                                                                                   HEADWATER
 "3-4 DWELLINGS/ACRE" B 22.89 0.75 0.600 56
                                                                               NUMBER
                                                                                         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                         65.49 15.63 1.793 0.75(0.45) 0.60 54.1 21330.00
```

Date: 04/21/2014

File name: LR0213ZZ.RES

Page 15

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 16

```
2 61.30 18.47 1.622 0.75(0.45) 0.60 58.0 21320.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 65.49 Tc (MIN.) = 15.63
 EFFECTIVE AREA(ACRES) = 54.13 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                  58.0
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21332.00 = 3039.02 FEET.
******************
 FLOW PROCESS FROM NODE 21332.00 TO NODE 21355.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1355.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 766.86 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 17.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.63
 PIPE-FLOW(CFS) =
                 65.49
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.69 Tc (MIN.) = 16.31
 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET.
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 16.31
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.748
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                                         αA
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 14.76
                                   0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 14.76
                           SUBAREA RUNOFF (CFS) = 17.25
 EFFECTIVE AREA(ACRES) = 68.89 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
                          PEAK FLOW RATE(CFS) =
 TOTAL AREA (ACRES) = 72.8
                                                80.52
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 10
    ______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<
_____
*****************
 FLOW PROCESS FROM NODE 21340.00 TO NODE 21341.00 IS CODE = 21
```

```
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 528.12
 ELEVATION DATA: UPSTREAM(FEET) = 1610.00 DOWNSTREAM(FEET) = 1530.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.378
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.813
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                               Ap
                                                      SCS Tc
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.56
                                       0.75
                                               0.600
                                                          7.38
                                                       56
 RESIDENTIAL
                      B 3.79 0.75
                                               0.700
                                                      56 7.84
 "2 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.687
 SUBAREA RUNOFF(CFS) = 9.00
 TOTAL AREA(ACRES) = 4.35 PEAK FLOW RATE(CFS) =
                                                  9.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21341.00 TO NODE 21342.00 IS CODE = 63
-----
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1530.00 DOWNSTREAM ELEVATION(FEET) = 1490.00
 STREET LENGTH (FEET) = 644.80 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.66
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                 22.96
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.40
   HALFSTREET FLOOD WIDTH (FEET) = 13.90
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 5.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.26
 STREET FLOW TRAVEL TIME (MIN.) = 1.92 Tc (MIN.) = 9.30
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.449
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fр
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 10.28 0.75
                                               0.600
                                                     56
 RESIDENTIAL
```

File name: LR0213ZZ.RES

Page 18

Date: 04/21/2014

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS

```
"2 DWELLINGS/ACRE"
                      В
                              5.38 0.75 0.700 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.634
 SUBAREA AREA(ACRES) = 15.66 SUBAREA RUNOFF(CFS) = 27.83
 EFFECTIVE AREA(ACRES) = 20.01 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) = 20.0 PEAK FLOW RATE (CFS) = 35.40
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH (FEET) = 0.46 HALFSTREET FLOOD WIDTH (FEET) = 16.48
 FLOW VELOCITY (FEET/SEC.) = 6.25 DEPTH*VELOCITY (FT*FT/SEC.) = 2.85
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21342.00 = 1172.92 FEET.
******************
 FLOW PROCESS FROM NODE 21342.00 TO NODE 21343.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1490.00 DOWNSTREAM ELEVATION(FEET) = 1425.00
 STREET LENGTH (FEET) = 1308.00 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL (DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
                                                    68.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.56
   HALFSTREET FLOOD WIDTH (FEET) = 20.88
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 7.20
   PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 4.02
 STREET FLOW TRAVEL TIME (MIN.) = 3.03 Tc (MIN.) = 12.32
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.068
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                               Аp
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 12.19
                                      0.75
                                               0.600
 RESIDENTIAL
 "2 DWELLINGS/ACRE" B 33.88 0.75
                                               0.700
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.674
 SUBAREA AREA(ACRES) = 46.07 SUBAREA RUNOFF(CFS) = 64.85
 EFFECTIVE AREA(ACRES) = 66.08 AREA-AVERAGED Fm(INCH/HR) = 0.50
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.67
 TOTAL AREA (ACRES) = 66.1 PEAK FLOW RATE (CFS) = 93.39
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61 HALFSTREET FLOOD WIDTH(FEET) = 23.44
 FLOW VELOCITY (FEET/SEC.) = 7.97 DEPTH*VELOCITY (FT*FT/SEC.) = 4.85
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 1308.0 FT WITH ELEVATION-DROP = 65.0 FT, IS 61.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21343.00
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21343.00 = 2480.92 FEET.
******************
 FLOW PROCESS FROM NODE 21343.00 TO NODE 21354.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1425.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 1461.18 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 20.9 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 18.60
 PIPE-FLOW(CFS) =
                  93.39
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.31 Tc (MIN.) = 13.63
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 13.63
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.946
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           αA
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 23.13 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 23.13 SUBAREA RUNOFF (CFS) = 31.17
 EFFECTIVE AREA(ACRES) = 89.21 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.65
 TOTAL AREA (ACRES) = 89.2 PEAK FLOW RATE (CFS) = 117.34
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
TOTAL NUMBER OF STREAMS = 2
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 20

```
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.083
 TIME OF CONCENTRATION (MIN.) = 13.63
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 RAINFALL INTENSITY (INCH/HR) = 1.95
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                             Fρ
 AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AREA-AVERAGED Fp (INCH/HR) = 0.75
                                                                          RESIDENTIAL
                                                                          "2 DWELLINGS/ACRE"
 AREA-AVERAGED Ap = 0.65
                                                                                            B 1.96 0.75 0.700
 EFFECTIVE STREAM AREA(ACRES) = 89.21
                                                                          RESIDENTIAL
 TOTAL STREAM AREA(ACRES) = 89.21
                                                                          "3-4 DWELLINGS/ACRE" B 0.22 0.75 0.600
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 117.34
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.690
******************
                                                                          SUBAREA AREA (ACRES) = 2.18 SUBAREA RUNOFF (CFS) = 3.07
                                                                          EFFECTIVE AREA(ACRES) = 7.05 AREA-AVERAGED Fm(INCH/HR) = 0.52
 FLOW PROCESS FROM NODE 21350.00 TO NODE 21351.00 IS CODE = 21
                                                                          AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                          TOTAL AREA (ACRES) = 7.1
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
                                                                                                      PEAK FLOW RATE(CFS) =
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 820.03
                                                                          5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 ELEVATION DATA: UPSTREAM(FEET) = 1555.00 DOWNSTREAM(FEET) = 1510.00
                                                                        *******************
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
                                                                          FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.50 IS CODE = 42
 SUBAREA ANALYSIS USED MINIMUM Tc (MIN.) = 10.778
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.241
                                                                          >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 SUBAREA TC AND LOSS RATE DATA(AMC II):
                                                                         >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Αp
                                                  SCS Tc
                                                                        ______
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                          UPSTREAM NODE ELEVATION (FEET) = 1480.00
 RESIDENTIAL
                                                                          DOWNSTREAM NODE ELEVATION (FEET) = 1460.00
 "2 DWELLINGS/ACRE" B 4.46
                                            0.700
                                                                          FLOW LENGTH (FEET) = 207.56 MANNING'S N = 0.013
                                     0.75
                                                  56 11.46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.41 0.75 0.600 56 10.78
                                                                          USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          DEPTH OF FLOW IN 45.0 INCH PIPE IS 5.0 INCHES
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.692
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 14.64
 SUBAREA RUNOFF (CFS) = 7.56
                                                                          PIPE-FLOW(CFS) =
                                                                                           9.94
 TOTAL AREA (ACRES) =
                    4.87 PEAK FLOW RATE (CFS) = 7.56
                                                                          *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 0.24 Tc (MIN.) = 12.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.50 = 1263.88 FEET.
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                         ******************
                                                                          FLOW PROCESS FROM NODE 21352.50 TO NODE 21352.50 IS CODE = 81
 FLOW PROCESS FROM NODE 21351.00 TO NODE 21352.00 IS CODE = 54
                                                                        ______
______
                                                                          >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                        _____
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
                                                                          MAINLINE Tc (MIN.) = 12.41
______
                                                                          * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.059
 ELEVATION DATA: UPSTREAM(FEET) = 1510.00 DOWNSTREAM(FEET) = 1480.00
                                                                          SUBAREA LOSS RATE DATA (AMC II):
 CHANNEL LENGTH THRU SUBAREA (FEET) = 236.29 CHANNEL SLOPE = 0.1270
                                                                          DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                          Fр
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                             LAND USE
                                                                                           GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                          RESIDENTIAL
                                                                          "3-4 DWELLINGS/ACRE" B 0.89 0.75 0.600
 CHANNEL FLOW THRU SUBAREA(CFS) = 7.56
 FLOW VELOCITY (FEET/SEC.) = 2.81 FLOW DEPTH (FEET) = 0.23
                                                                          RESIDENTIAL
 TRAVEL TIME (MIN.) = 1.40 Tc (MIN.) = 12.18
                                                                          "2 DWELLINGS/ACRE"
                                                                                             B 6.98 0.75 0.700
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21352.00 = 1056.32 FEET.
                                                                          SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.689
******************
                                                                          SUBAREA AREA(ACRES) = 7.87 SUBAREA RUNOFF(CFS) = 10.93
 FLOW PROCESS FROM NODE 21352.00 TO NODE 21352.00 IS CODE = 81
                                                                          EFFECTIVE AREA(ACRES) = 14.92 AREA-AVERAGED Fm(INCH/HR) = 0.52
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                          TOTAL AREA(ACRES) = 14.9
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                                                      PEAK FLOW RATE(CFS) =
_____
 MAINLINE Tc(MIN.) = 12.18
                                                                          SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
```

Date: 04/21/2014 File name: LR0213ZZ.RES Date: 04/21/2014 File name: LR0213ZZ.RES Page 21 Page 22

SCS

56

9.94

Ар

SCS

56

20.72

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                           *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                           PIPEFLOW TRAVEL TIME (MIN.) = 2.35 Tc (MIN.) = 15.12
******************
                                                                           LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21354.00 = 3580.73 FEET.
 FLOW PROCESS FROM NODE 21352.50 TO NODE 21353.00 IS CODE = 42
                                                                          ************************
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                           FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 81
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
                                                                           >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          _____
 UPSTREAM NODE ELEVATION (FEET) = 1460.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1450.00
                                                                           MAINLINE Tc(MIN.) = 15.12
 FLOW LENGTH (FEET) = 277.00 MANNING'S N = 0.013
                                                                           * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.829
                                                                           SUBAREA LOSS RATE DATA (AMC II):
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
                                                                           DEVELOPMENT TYPE/
                                                                                              SCS SOIL AREA
                                                                                                             Fр
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 9.1 INCHES
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               LAND USE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.91
                                                                           RESIDENTIAL
                                                                           "3-4 DWELLINGS/ACRE"
                                                                                             В 33.72
                                                                                                                0.75
 PIPE-FLOW(CFS) = 20.72
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                           COMMERCIAL
                                                                                                В
                                                                                                      0.32
                                                                                                                0.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.36 Tc (MIN.) = 12.77
                                                                           RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 21350.00 TO NODE 21353.00 = 1540.88 FEET.
                                                                           "2 DWELLINGS/ACRE"
                                                                                               В 1.48
                                                                                                               0.75 0.700
                                                                           SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
*******************
                                                                           SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21353.00 IS CODE = 81
                                                                           SUBAREA AREA (ACRES) = 35.52 SUBAREA RUNOFF (CFS) = 44.14
______
                                                                           EFFECTIVE AREA(ACRES) = 59.69 AREA-AVERAGED Fm(INCH/HR) = 0.48
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
_____
                                                                           TOTAL AREA (ACRES) = 59.7
                                                                                                        PEAK FLOW RATE(CFS) =
 MAINLINE Tc(MIN.) = 12.77
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.024
                                                                           SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 SUBAREA LOSS RATE DATA (AMC II):
                                                                           5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                   SCS
                                                                          ******************
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                                                                           FLOW PROCESS FROM NODE 21354.00 TO NODE 21354.00 IS CODE = 1
 "3-4 DWELLINGS/ACRE" B 1.59
                                     0.75
                                             0.600
                                                  56
 RESIDENTIAL
                                                                           >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
 "2 DWELLINGS/ACRE"
                    В
                             7.66
                                     0.75
                                             0.700
                                                                           >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                          ______
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.683
                                                                           TOTAL NUMBER OF STREAMS = 2
 SUBAREA AREA (ACRES) = 9.25
                             SUBAREA RUNOFF (CFS) = 12.60
                                                                           CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 EFFECTIVE AREA(ACRES) = 24.17 AREA-AVERAGED Fm(INCH/HR) = 0.51
                                                                           TIME OF CONCENTRATION (MIN.) = 15.12
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.69
                                                                           RAINFALL INTENSITY (INCH/HR) = 1.83
                  24.2 PEAK FLOW RATE (CFS) =
                                                    32.85
 TOTAL AREA (ACRES) =
                                                                           AREA-AVERAGED Fm(INCH/HR) = 0.48
                                                                           AREA-AVERAGED Fp (INCH/HR) = 0.75
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                           AREA-AVERAGED Ap = 0.64
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                           EFFECTIVE STREAM AREA(ACRES) = 59.69
                                                                           TOTAL STREAM AREA(ACRES) = 59.69
******************
                                                                           PEAK FLOW RATE (CFS) AT CONFLUENCE =
                                                                                                            72.75
 FLOW PROCESS FROM NODE 21353.00 TO NODE 21354.00 IS CODE = 42
                                                                           ** CONFLUENCE DATA **
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                            STREAM
                                                                                   Q Tc Intensity Fp(Fm) Ap Ae
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                            NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR)
_____
                                                                            1
                                                                                    117.34 13.63 1.946 0.75(0.48) 0.65 89.2 21340.00
 UPSTREAM NODE ELEVATION (FEET) = 1450.00
                                                                              2
                                                                                    72.75 15.12 1.829 0.75(0.48) 0.64
 DOWNSTREAM NODE ELEVATION (FEET) = 1380.00
 FLOW LENGTH (FEET) = 2039.85 MANNING'S N = 0.013
                                                                           RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
                                                                           CONFLUENCE FORMULA USED FOR 2 STREAMS.
 USER SPECIFIED PIPE DIAMETER (INCH) = 45.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 11.6 INCHES
                                                                           ** PEAK FLOW RATE TABLE **
 PIPE-FLOW VELOCITY (FEET/SEC.) = 14.49
                                                                            STREAM Q Tc Intensity Fp(Fm)
 PIPE-FLOW(CFS) =
                                                                            NUMBER
                                                                                     (CFS) (MIN.) (INCH/HR) (INCH/HR)
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Date: 04/21/2014 File name: LR0213ZZ.RES Page 24

SCS

56

56

HEADWATER

HEADWATER

NODE

59.7 21350.00

(ACRES) NODE

Аe

(ACRES)

0.600

0.100

```
188.62 13.63 1.946 0.75(0.48) 0.64
                                           143.0 21340.00
         180.69 15.12 1.829 0.75(0.48) 0.64
                                           148.9 21350.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 188.62 Tc (MIN.) =
                                      13.63
 EFFECTIVE AREA(ACRES) = 143.04 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) = 148.9
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21354.00 = 3942.10 FEET.
******************
 FLOW PROCESS FROM NODE 21354.00 TO NODE 21355.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1325.00
 FLOW LENGTH (FEET) = 1308.82 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 54.0 INCH PIPE IS 26.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 24.93
 PIPE-FLOW(CFS) = 188.62
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.88 Tc (MIN.) = 14.51
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET.
******************
 FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 14.51
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.875
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
     LAND USE
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          6.86
                                    0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 6.86 SUBAREA RUNOFF(CFS) = 8.81
 EFFECTIVE AREA(ACRES) = 149.90 AREA-AVERAGED Fm(INCH/HR) = 0.48
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.64
 TOTAL AREA (ACRES) =
                  155.8
                            PEAK FLOW RATE(CFS) = 188.62
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<
______
 ** MAIN STREAM CONFLUENCE DATA **
```

Date: 04/21/2014 File name: LR0213ZZ.RES Page 25

NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE 1 188.62 14.56 1.871 0.75(0.48) 0.64 149.9 21340.00 2 180.69 16.06 1.764 0.75(0.48)0.64 155.8 21350.00 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET. \*\* MEMORY BANK # 2 CONFLUENCE DATA \*\* Ар Ае STREAM 0 Tc Intensity Fp(Fm) HEADWATER (ACRES) NODE NUMBER (CFS) (MIN.) (INCH/HR) (INCH/HR) 80.35 16.36 1.745 0.75(0.45) 0.60 68.9 21330.00 1 1.584 0.75(0.45) 0.60 72.8 21320.00 74.41 19.21 LONGEST FLOWPATH FROM NODE 21320.00 TO NODE 21355.00 = 3805.88 FEET. \*\* PEAK FLOW RATE TABLE \*\* STREAM 0 Tc Intensity Fp(Fm) Ap Ae HEADWATER (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE NUMBER 1 267.11 14.56 1.871 0.75(0.47) 0.63 211.2 21340.00 260.76 16.06 1.764 0.75(0.47) 0.63 223.4 21350.00 258.32 16.36 1.745 0.75(0.47) 0.63 224.6 21330.00 229.79 19.21 1.584 0.75(0.47) 0.63 228.6 21320.00 TOTAL AREA(ACRES) = 228.6 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: PEAK FLOW RATE (CFS) = 267.11 Tc (MIN.) = 14.563EFFECTIVE AREA(ACRES) = 211.23 AREA-AVERAGED Fm(INCH/HR) = 0.47 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63TOTAL AREA (ACRES) = 228.6 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21355.00 = 5250.92 FEET. FLOW PROCESS FROM NODE 21355.00 TO NODE 21355.00 IS CODE = 12 >>>>CLEAR MEMORY BANK # 2 <<<< \_\_\_\_\_\_ FLOW PROCESS FROM NODE 21355.00 TO NODE 21356.00 IS CODE = 42 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA< >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) << UPSTREAM NODE ELEVATION (FEET) = 1325.00 DOWNSTREAM NODE ELEVATION (FEET) = 1315.00 FLOW LENGTH (FEET) = 763.37 MANNING'S N = 0.013USER SPECIFIED PIPE DIAMETER (INCH) = 75.00 NUMBER OF PIPES = 1 DEPTH OF FLOW IN 75.0 INCH PIPE IS 37.2 INCHES PIPE-FLOW VELOCITY(FEET/SEC.) = 17.57PIPE-FLOW(CFS) = 267.11\*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW\* PIPEFLOW TRAVEL TIME (MIN.) = 0.72 Tc (MIN.) = 15.29 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21356.00 = 6014.29 FEET. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21356.00 TO NODE 21356.00 IS CODE = 81 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW< \_\_\_\_\_

Date: 04/21/2014 File name: LR0213ZZ.RES

Tc Intensity Fp(Fm) Ap Ae

HEADWATER

Page 26

STREAM

0

```
MAINLINE Tc(MIN.) = 15.29
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.817
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp
                                            Аp
                                                    SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.42 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                             SUBAREA RUNOFF(CFS) = 5.44
 SUBAREA AREA(ACRES) = 4.42
 EFFECTIVE AREA(ACRES) = 215.65 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.63
 TOTAL AREA (ACRES) = 233.0
                               PEAK FLOW RATE (CFS) = 267.11
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21356.00 TO NODE 21357.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1315.00 DOWNSTREAM(FEET) = 1296.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 552.93 CHANNEL SLOPE = 0.0344
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) = 267.11
 FLOW VELOCITY (FEET/SEC.) = 10.26 FLOW DEPTH (FEET) = 2.13
 TRAVEL TIME (MIN.) = 0.90 Tc (MIN.) = 16.19
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21357.00 = 6567.22 FEET.
******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21357.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.19
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.756
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 38.32
                                   0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 38.32 SUBAREA RUNOFF (CFS) = 45.08
 EFFECTIVE AREA(ACRES) = 253.97 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 271.3 PEAK FLOW RATE (CFS) =
                                                    294.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21357.00 TO NODE 21358.00 IS CODE = 54
```

```
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1296.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 511.89 CHANNEL SLOPE = 0.0215
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 8.92 FLOW DEPTH (FEET) = 2.53
 TRAVEL TIME (MIN.) = 0.96 Tc (MIN.) = 17.14
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21358.00 = 7079.11 FEET.
*******************
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21358.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc (MIN.) = 17.14
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.696
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fp
                                                 SCS
                                          qΑ
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.40 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 7.40
                           SUBAREA RUNOFF (CFS) = 8.31
 EFFECTIVE AREA(ACRES) = 261.37 AREA-AVERAGED Fm(INCH/HR) = 0.47
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) = 278.7 PEAK FLOW RATE (CFS) =
                                                 294.60
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21358.00 TO NODE 21359.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1285.00 DOWNSTREAM(FEET) = 1267.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 575.39 CHANNEL SLOPE = 0.0313
 CHANNEL BASE (FEET) = 8.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 4.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             294 60
 FLOW VELOCITY (FEET/SEC.) = 10.20 FLOW DEPTH (FEET) = 2.29
 TRAVEL TIME (MIN.) = 0.94 Tc (MIN.) = 18.08
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21359.00 = 7654.50 FEET.
******************
 FLOW PROCESS FROM NODE 21359.00 TO NODE 21359.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 18.08
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.643
 SUBAREA LOSS RATE DATA (AMC II):
```

File name: LR021377.RFS

Page 28

Date: 04/21/2014

DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE" B 4.95 0.75 0.600 56 COMMERCIAL B 2.16 0.75 0.100 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.448
SUBAREA AREA (ACRES) = 7.11 SUBAREA RUNOFF (CFS) = 8.37
EFFECTIVE AREA (ACRES) = 268.48 AREA-AVERAGED Fm (INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62 TOTAL AREA(ACRES) = 285.8 PEAK FLOW RATE(CFS) = 294.60
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
NOTE, TEAK FROW NATE DEFAURTED TO OTSTREAM VARIOE
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
*****************
FLOW PROCESS FROM NODE 21359.00 TO NODE 21360.00 IS CODE = 42
>>>>COMPLIED DIDE DION DAMES MIND CHORDS ////
>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<>> >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<
======================================
UPSTREAM NODE ELEVATION(FEET) = 1267.00
DOWNSTREAM NODE ELEVATION(FEET) = 1255.00
FLOW LENGTH (FEET) = 711.66 MANNING'S N = 0.013
USER SPECIFIED PIPE DIAMETER (INCH) = 78.00 NUMBER OF PIPES = 1
DEPTH OF FLOW IN 78.0 INCH PIPE IS 35.9 INCHES
PIPE-FLOW VELOCITY (FEET/SEC.) = 19.78
PIPE-FLOW(CFS) = 294.60
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW* PIPEFLOW TRAVEL TIME (MIN.) = 0.60 Tc (MIN.) = 18.68
LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET.
**************************************
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 81
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 18.68
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.611
SUBAREA LOSS RATE DATA (AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA FP AP SCS LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL GROUP (ACRES) (INCH/HK) (DECIMAL) CN
"3-4 DWELLINGS/ACRE" B 3.67 0.75 0.600 56
MOBILE HOME PARK B 0.92 0.75 0.250 56
MOBILE HOME PARK B 0.92 0.75 0.250 56 COMMERCIAL B 0.01 0.75 0.100 56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.529
SUBAREA AREA (ACRES) = 4.60 SUBAREA RUNOFF (CFS) = 5.03
EFFECTIVE AREA (ACRES) = 273.08 AREA-AVERAGED Fm (INCH/HR) = 0.46
AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
TOTAL AREA (ACRES) = 290.4 PEAK FLOW RATE (CFS) = 294.60
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
5M = 0.30; $30M = 0.61$ ; $1HR = 0.80$ ; $3HR = 1.29$ ; $6HR = 1.74$ ; $24HR = 3.20$

```
FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM
          Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
  NUMBER
          293.92 18.77 1.607 0.75(0.46) 0.62 273.1 21340.00
   1
    2
          286.27 20.29 1.533 0.75(0.46) 0.62 285.2 21350.00
          283.62 20.60 1.519 0.75(0.46) 0.62 286.5 21330.00
          253.36 23.59 1.401 0.75(0.46) 0.62 290.4 21320.00
 LONGEST FLOWPATH FROM NODE 21340.00 TO NODE 21360.00 = 8366.16 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
         Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
  NUMBER
         (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
   1
          215.46 23.65 1.399 0.75(0.46) 0.61 251.9 21300.00
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
 ** PEAK FLOW RATE TABLE **
                Tc Intensity Fp(Fm) Ap Ae HEADWATER
  STREAM
         0
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
          502.80 18.77 1.607 0.75(0.46) 0.62 473.0 21340.00
    1
          497.64 20.29 1.533 0.75(0.46) 0.62
                                               501.4 21350.00
          495.44 20.60 1.519 0.75 (0.46) 0.62
                                               505.9 21330.00
          468.76 23.59 1.401 0.75 (0.46) 0.62
                                               541.7 21320.00
    5
          468.29 23.65 1.399 0.75(0.46) 0.62
                                               542.3 21300.00
  TOTAL AREA(ACRES) =
                       542.3
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 502.80 Tc (MIN.) = 18.768
 EFFECTIVE AREA(ACRES) = 473.00 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.62
 TOTAL AREA (ACRES) =
                     542.3
 LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21360.00 = 10322.36 FEET.
***********************
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21360.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 1 <<<<<
 FLOW PROCESS FROM NODE 21360.00 TO NODE 21361.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1255.00 DOWNSTREAM(FEET) = 1240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 770.40 CHANNEL SLOPE = 0.0195
 CHANNEL BASE (FEET) = 12.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.035 MAXIMUM DEPTH (FEET) = 6.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                               502.80
 FLOW VELOCITY (FEET/SEC.) = 9.66 FLOW DEPTH (FEET) = 2.92
 TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 20.10
      Date: 04/21/2014 File name: LR0213ZZ.RES
                                                   Page 30
```

\*

```
LONGEST FLOWPATH FROM NODE 21300.00 TO NODE 21361.00 = 11092.76 FEET.
******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 20.10
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.542
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                               Fр
                                         Ap SCS
                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  В
                          11.84
                                  0.75
                                         0.600
                                              56
 MOBILE HOME PARK
                    В
                         3.43
                                  0.75
                                         0.250
                                               56
                                         0.100
 COMMERCIAL
                    В
                           1.54
                                  0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.483
 SUBAREA AREA(ACRES) = 16.81
                          SUBAREA RUNOFF(CFS) = 17.87
 EFFECTIVE AREA(ACRES) = 489.81 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 559.1
                          PEAK FLOW RATE(CFS) =
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
******************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 15.1
 >>>> DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21248.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 951.87 Tc (MIN.) = 34.30
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.58
 TOTAL AREA (ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
*********************
 FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
_____
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 951.87 Tc (MIN.) = 34.30
 AREA-AVERAGED Fm(INCH/HR) = 0.46 Ybar = 0.58
 TOTAL AREA (ACRES) = 1340.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21248.00 = 15575.76 FEET.
```

```
>>>>CLEAR MEMORY BANK # 2 <<<<
_____
FLOW PROCESS FROM NODE 21248.00 TO NODE 21361.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1280.00 DOWNSTREAM(FEET) = 1240.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1507.42 CHANNEL SLOPE = 0.0265
 CHANNEL BASE (FEET) = 9.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 5.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             951.87
 FLOW VELOCITY (FEET/SEC.) = 24.34 FLOW DEPTH (FEET) = 2.71
 TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 35.34
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
*******************
 FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 35.34
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.099
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                    Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                      В
                            42.57
                                     0.75
                                            0.600
                                                    56
 MOBILE HOME PARK
                      В
                            41.35
                                     0.75
                                            0.250
                                                    56
 COMMERCIAL
                      В
                           17.40
                                     0.75
                                            0.100
                                                   56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                      В
                             0.33
                                     0.63
                                           1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.373
 SUBAREA AREA(ACRES) = 101.65
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.82;3H= 1.34;6H= 1.84;24H= 3.50
 S-GRAPH: VALLEY(DEV.) = 94.5%; VALLEY(UNDEV.) / DESERT = 5.5%
       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.45; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1442.0
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0346; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0285; Lca/L=0.6,n=.0266
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 198.46
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1001.24
 TOTAL AREA (ACRES) = 1442.0
                              PEAK FLOW RATE (CFS) = 1001.24
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
```

FLOW PROCESS FROM NODE 21248.00 TO NODE 21248.00 IS CODE = 12

Date: 04/21/2014 File name: LR0213ZZ.RES Page 31 Date: 04/21/2014

File name: LR0213ZZ.RES Page 32

STREAM	Q	Tc	Intensity	Fp(Fm)	Аp	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	502.80	20.10	1.542	0.75( 0.46)	0.61	489.8	21340.00
2	497.64	21.63	1.476	0.75( 0.46)	0.61	518.2	21350.00
3	495.44	21.94	1.463	0.75( 0.46)	0.61	522.8	21330.00
4	468.76	24.95	1.354	0.75( 0.46)	0.61	558.6	21320.00
5	468.29	25.01	1.353	0.75( 0.46)	0.61	559.1	21300.00
LONGEST	FLOWPATH E	FROM NODE	21300.00	TO NODE 2	1361.00	= 1109	92.76 FEET.

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.33;6H= 1.81;24H= 3.41

S-GRAPH: VALLEY(DEV.) = 96.0%; VALLEY(UNDEV.)/DESERT= 4.0%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.45; Ybar = 0.57

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR = 1.00

UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2001.2

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21361.00 = 17083.18 FEET. EQUIVALENT BASIN FACTOR APPROXIMATIONS:

\*

Lca/L=0.3,n=.0346; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0285; Lca/L=0.6,n=.0266 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 264.83

PEAK FLOW RATE (CFS) = 1334.64

FLOW PROCESS FROM NODE 21361.00 TO NODE 21361.00 IS CODE = 12

>>>>CLEAR MEMORY BANK # 1 <<<<

FLOW PROCESS FROM NODE 21361.00 TO NODE 21378.00 IS CODE = 54

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <

ELEVATION DATA: UPSTREAM(FEET) = 1240.00 DOWNSTREAM(FEET) = 1235.00 CHANNEL LENGTH THRU SUBAREA(FEET) = 988.61 CHANNEL SLOPE = 0.0051 CHANNEL BASE(FEET) = 13.00 "Z" FACTOR = 2.000 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 6.50 CHANNEL FLOW THRU SUBAREA(CFS) = 1334.64 FLOW VELOCITY(FEET/SEC.) = 14.30 FLOW DEPTH(FEET) = 4.32

\_\_\_\_\_

TRAVEL TIME (MIN.) = 1.15 Tc (MIN.) = 36.49

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.

Date: 04/21/2014 File name: LR0213ZZ.RES Page 33

\*

FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<

MAINLINE Tc(MIN.) = 36.49

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.078

SUBAREA LOSS RATE DATA (AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fр LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN RESIDENTIAL "3-4 DWELLINGS/ACRE" В 4.75 0.75 0.600 56 11.57 56 COMMERCIAL В 0.75 0.100 MOBILE HOME PARK В 12.66 0.75 0.250

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.247

SUBAREA AREA(ACRES) = 28.98

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.33;6H= 1.81;24H= 3.41

S-GRAPH: VALLEY(DEV.) = 96.1%; VALLEY(UNDEV.)/DESERT= 3.9%

MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%

Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.45; Ybar = 0.57

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR = 1.00

UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2030.2

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0339; Lca/L=0.4,n=.0304; Lca/L=0.5,n=.0279; Lca/L=0.6,n=.0261

TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 270.57

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1309.30

TOTAL AREA (ACRES) = 2030.2 PEAK FLOW RATE (CFS) = 1334.64

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20

\*

FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1

>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE

\_\_\_\_\_\_

TOTAL NUMBER OF STREAMS = 2

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:

PEAK FLOW RATE (CFS) = 1334.64 Tc (MIN.) = 36.49

AREA-AVERAGED Fm (INCH/HR) = 0.45 Ybar = 0.57

TOTAL AREA (ACRES) = 2030.2

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FLOW PROCESS FROM NODE 21370.00 TO NODE 21371.00 IS CODE = 21

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS

>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<

INITIAL SUBAREA FLOW-LENGTH (FEET) = 627.80

ELEVATION DATA: UPSTREAM(FEET) = 1415.00 DOWNSTREAM(FEET) = 1390.00

-----

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 34

```
Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 7.620
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.759
 SUBAREA TC AND LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                      SCS Tc
                                       Fρ
                                                Αp
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
                                                     56 10.33
 "3-4 DWELLINGS/ACRE"
                               3.63
                                        0.75
                                               0.600
                    В
                      B
                               3.67
                                       0.75 0.100 56 7.62
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.349
 SUBAREA RUNOFF (CFS) = 16.42
 TOTAL AREA (ACRES) = 7.30 PEAK FLOW RATE (CFS) = 16.42
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
*****
 FLOW PROCESS FROM NODE 21371.00 TO NODE 21372.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1390.00 DOWNSTREAM ELEVATION(FEET) = 1380.00
 STREET LENGTH (FEET) = 602.50 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.48
   HALFSTREET FLOOD WIDTH (FEET) = 17.49
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
 STREET FLOW TRAVEL TIME (MIN.) = 2.99 Tc (MIN.) = 10.61
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.262
 SUBAREA LOSS RATE DATA (AMC II):
                                              Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                               5.99
                                       0.75 0.600 56
 COMMERCIAL
                      В
                               0.01
                                        0.75 0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.599
 SUBAREA AREA (ACRES) = 6.00 SUBAREA RUNOFF (CFS) = 9.79
 EFFECTIVE AREA(ACRES) = 13.30 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.46
 TOTAL AREA (ACRES) = 13.3
                              PEAK FLOW RATE(CFS) =
```

```
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49 HALFSTREET FLOOD WIDTH(FEET) = 18.00
 FLOW VELOCITY (FEET/SEC.) = 3.40 DEPTH*VELOCITY (FT*FT/SEC.) = 1.66
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21372.00 = 1230.30 FEET.
******************
 FLOW PROCESS FROM NODE 21372.00 TO NODE 21373.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1380.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1365.00
 FLOW LENGTH (FEET) = 527.76 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 11.0 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 12.49
 PIPE-FLOW(CFS) =
                   22.94
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.75 Tc (MIN.) = 11.36
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.172
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                   Αp
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.16 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 5.16 SUBAREA RUNOFF (CFS) = 8.00
 EFFECTIVE AREA(ACRES) = 18.46 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.50
 TOTAL AREA (ACRES) = 18.5 PEAK FLOW RATE (CFS) =
                                                         29.86
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 6.92
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.32
   HALFSTREET FLOOD WIDTH (FEET) = 9.91
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.14
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.02
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21373.00 = 1758.06 FEET.
```

File name: LR0213ZZ.RES

Page 36

SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):

Date: 04/21/2014

```
*************************
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1345.00
 FLOW PROCESS FROM NODE 21373.00 TO NODE 21374.00 IS CODE = 33
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1330.00
                                                                                FLOW LENGTH (FEET) = 319.60 MANNING'S N = 0.013
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.4 INCHES
 UPSTREAM NODE ELEVATION (FEET) = 1365.00
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 17.11
 DOWNSTREAM NODE ELEVATION (FEET) = 1345.00
                                                                                PIPE-FLOW(CFS) = 37.07
 FLOW LENGTH (FEET) = 326.48 MANNING'S N = 0.013
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.31 Tc (MIN.) = 12.00
                                                                                LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21375.00 = 2404.14 FEET.
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 10.4 INCHES
                                                                              *******************
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.72
 PIPE-FLOW(CFS) =
                  29.86
                                                                                FLOW PROCESS FROM NODE 21375.00 TO NODE 21375.00 IS CODE = 81
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                              ______
 PIPEFLOW TRAVEL TIME (MIN.) = 0.33 Tc (MIN.) = 11.68
                                                                                >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.135
                                                                              ______
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                MAINLINE Tc(MIN.) = 12.00
  DEVELOPMENT TYPE/
                  SCS SOIL AREA
                                     Fρ
                                                                                * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.102
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                SUBAREA LOSS RATE DATA (AMC II):
     LAND USE
 RESIDENTIAL
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                   Fp
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 "3-4 DWELLINGS/ACRE"
                    В
                             4.94
                                        0.75 0.600 56
                                                                                   LAND USE
                                                                                RESIDENTIAL
 COMMERCIAL
                      В
                               0.17
                                     0.75
                                              0.100 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                                "3-4 DWELLINGS/ACRE" B 10.88 0.75 0.600
                                                                                                    B 14.84 0.75 0.100
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.583
                                                                                COMMERCIAL
 SUBAREA AREA(ACRES) = 5.11 SUBAREA RUNOFF(CFS) = 7.81
                                                                                SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 EFFECTIVE AREA(ACRES) = 23.57 AREA-AVERAGED Fm(INCH/HR) = 0.39
                                                                                SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.312
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.52
                                                                                SUBAREA AREA (ACRES) = 25.72 SUBAREA RUNOFF (CFS) = 43.26
 TOTAL AREA(ACRES) = 23.6 PEAK FLOW RATE(CFS) =
                                                                                EFFECTIVE AREA(ACRES) = 49.29 AREA-AVERAGED Fm(INCH/HR) = 0.31
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.41
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                TOTAL AREA (ACRES) = 49.3 PEAK FLOW RATE (CFS) =
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
                                                                                SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 STREET CROSS-SECTION INFORMATION:
                                                                                5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
 CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
                                                                              ********************
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                FLOW PROCESS FROM NODE 21375.00 TO NODE 21376.00 IS CODE = 42
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                              ______
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                                >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.64
                                                                                >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                                UPSTREAM NODE ELEVATION (FEET) = 1330.00
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                DOWNSTREAM NODE ELEVATION (FEET) = 1275.00
                                                                                FLOW LENGTH (FEET) = 1914.40 MANNING'S N = 0.013
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 7.21
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                USER SPECIFIED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
  STREET FLOW DEPTH(FEET) = 0.30
                                                                                DEPTH OF FLOW IN 42.0 INCH PIPE IS 20.2 INCHES
  HALFSTREET FLOOD WIDTH (FEET) = 8.51
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 17.42
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.28
                                                                                PIPE-FLOW(CFS) = 79.61
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.27
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21374.00 = 2084.54 FEET.
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 1.83 Tc (MIN.) = 13.83
                                                                                LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21376.00 = 4318.54 FEET.
*******************
                                                                              FLOW PROCESS FROM NODE 21374.00 TO NODE 21375.00 IS CODE = 42
                                                                                FLOW PROCESS FROM NODE 21376.00 TO NODE 21376.00 IS CODE = 81
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
```

Date: 04/21/2014

File name: LR021377.RFS

Date: 04/21/2014 File name: LR0213ZZ.RES Page 38

56

79.61

56

```
MAINLINE Tc (MIN.) = 13.83
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.930
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fρ
                                            Aр
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                           33.59
                                           0.600
 "3-4 DWELLINGS/ACRE"
                  В
                                    0.75
                    В
                           3.65
 MOBILE HOME PARK
                                    0.75
                                           0.250 56
                                           0.100 56
 COMMERCIAL
                    В
                            1.26
                                    0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.550
 SUBAREA AREA (ACRES) = 38.50
                            SUBAREA RUNOFF (CFS) = 52.60
 EFFECTIVE AREA(ACRES) = 87.79 AREA-AVERAGED Fm(INCH/HR) = 0.35
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.47
 TOTAL AREA(ACRES) = 87.8 PEAK FLOW RATE(CFS) =
                                               124.60
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
FLOW PROCESS FROM NODE 21376.00 TO NODE 21377.00 IS CODE = 42
______
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1275.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1257.00
 FLOW LENGTH (FEET) = 629.69 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 48.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 48.0 INCH PIPE IS 24.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 19.45
 PIPE-FLOW(CFS) = 124.60
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 14.37
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21377.00 = 4948.23 FEET.
********************
 FLOW PROCESS FROM NODE 21377.00 TO NODE 21377.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 14.37
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.886
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                         Аp
                                                 SCS
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                    В
 MOBILE HOME PARK
                           12.70
                                  0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                          4.69
                                    0.75
                                         0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.344
 SUBAREA AREA(ACRES) = 17.39
                            SUBAREA RUNOFF (CFS) = 25.49
 EFFECTIVE AREA(ACRES) = 105.18 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
 TOTAL AREA(ACRES) = 105.2
                           PEAK FLOW RATE (CFS) = 146.62
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
FLOW PROCESS FROM NODE 21377.00 TO NODE 21378.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1257.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1235.00
 FLOW LENGTH (FEET) = 1320.25 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 57.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 57.0 INCH PIPE IS 28.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 16.55
 PIPE-FLOW(CFS) = 146.62
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.33 Tc (MIN.) = 15.70
 LONGEST FLOWPATH FROM NODE 21370.00 TO NODE 21378.00 = 6268.48 FEET.
******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 15.70
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.789
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   LAND USE
 MOBILE HOME PARK B 17.63 0.75 0.250
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.65 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.262
 SUBAREA AREA(ACRES) = 18.28
                            SUBAREA RUNOFF (CFS) = 26.20
 EFFECTIVE AREA(ACRES) = 123.46 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.42
                  123.5
 TOTAL AREA (ACRES) =
                              PEAK FLOW RATE (CFS) = 163.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20
******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.70
 RAINFALL INTENSITY (INCH/HR) = 1.79
 AREA-AVERAGED Fm(INCH/HR) = 0.32
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.42
 EFFECTIVE STREAM AREA(ACRES) = 123.46
```

Date: 04/21/2014 File name: LR0213ZZ.RES

Page 40

TOTAL STREAM AREA(ACRES) = 123.46 PEAK FLOW RATE (CFS) AT CONFLUENCE = 163.58 \*\* CONFLUENCE DATA \*\* STREAM 0 TC AREA HEADWATER NUMBER (CFS) (MIN.) (ACRES) NODE 1 1334.64 36.49 2030.17 21100.00 2. 163.58 15.70 123.46 21370.00 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS: UNIT-HYDROGRAPH DATA: RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.33;6H= 1.81;24H= 3.40 S-GRAPH: VALLEY (DEV.) = 96.3%; VALLEY (UNDEV.) / DESERT = 3.7% MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0% Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.44; Ybar = 0.56 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION. DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90; 3HR = 0.99; 6HR = 0.99; 24HR = 1.00UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2153.6 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET. EOUIVALENT BASIN FACTOR APPROXIMATIONS: Lca/L=0.3,n=.0339; Lca/L=0.4,n=.0304; Lca/L=0.5,n=.0279; Lca/L=0.6,n=.0261 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 290.25 PEAK FLOW RATE (CFS) = 1389.13\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 152 >>>>STORE PEAK FLOWRATE TABLE TO A FILE< \_\_\_\_\_\_ PEAK FLOWRATE TABLE FILE NAME: 21378.DNA \_\_\_\_\_ END OF STUDY SUMMARY: TOTAL AREA (ACRES) = 2153.6 TC(MIN.) = AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.56PEAK FLOW RATE (CFS) = 1389.13\_\_\_\_\_ \_\_\_\_\_\_ END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

Date: 04/21/2014 File name: LR0213ZZ.RES Page 41 Date: 04/21/2014 File name: LR0213ZZ.RES Page 42

\*

RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION) (c) Copyright 1983-2013 Advanced Engineering Software (aes) Ver. 20.0 Release Date: 06/01/2013 License ID 1264

## Analysis prepared by:

RBF Consulting 14257 Alton Parkway Irvine, CA 92618

\* DESCRIPTION OF STUDY \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* REDLANDS MPD - UPDATE

\* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21470

\* 10-YR HC ULTIMATE CONDITION OCT 2013 DMALOTT

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

FILE NAME: LR0214ZZ.DAT

Date: 04/21/2014

TIME/DATE OF STUDY: 15:25 04/03/2014

\_\_\_\_\_

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:

\_\_\_\_\_\_\_

## --\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT (YEAR) = 10.00 SPECIFIED MINIMUM PIPE SIZE(INCH) = 24.00

SPECIFIED PERCENT OF GRADIENTS (DECIMAL) TO USE FOR FRICTION SLOPE = 0.85 \*USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL\*

SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000 USER SPECIFIED 1-HOUR INTENSITY (INCH/HOUR) = 1.2500

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

HALF- CROWN TO STREET-CROSSFALL: CURB GUTTER-GEOMETRIES: MANNING WIDTH CROSSFALL IN- / OUT-/PARK- HEIGHT WIDTH LIP HIKE FACTOR (FT) (FT) SIDE / SIDE/ WAY (FT) (FT) (FT) (FT) 18.0 12.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 20.0 15.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 22.0 15.0 0.020/0.020/0.020 0.67 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.50 18.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 0.020/0.020/0.020 15.0 10.0 0.67 2.00 0.0312 0.167 0.0180 16.0 10.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 16.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 17.0 10.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 2.00 0.0312 0.167 0.0180 10 30.0 15.0 0.020/0.020/0.020 0.67 11 24.0 15.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180 24.0 0.020/0.020/0.020 2.00 0.0312 0.167 0.0180 12 15.0 0.67 13 32.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 39.0 14 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 15 36.0 20.0 0.020/0.020/0.020 0.67 2.00 0.0312 0.167 0.0180 16 12.5 5.0 0.020/0.020/0.020 0.50 1.50 0.0312 0.125 0.0180

File name: LR0214ZZ.RES

Page 1

17	20.0	10.0	0.020/0.02	0/0.020	0.50	1.50	0.0312 0	.125	0.0180
18 19	26.0 52.0	15.0 20.0	0.020/0.02 0.020/0.02 0.020/0.02	0/0.020 0/0.020	0.67 0.67	2.00	0.0312 0 0.0312 0	.167 .167	0.0180 0.0180
2 *S] OF	1. Relati as (Ma 2. (Depth IZE PIPE R EQUAL T	ve Flow-I ximum All )*(Veloci WITH A FI O THE UPS	DEPTH CONSTR Depth = 0.2 Lowable Streety) Constra LOW CAPACITY STREAM TRIBU	O FEET et Flow D int = 6. GREATER TARY PIPE	0 (FT*F'THAN	T/S)		TED	
V U 1 E E	WATERSHED USED "VAL 1 UNITS/A FOR DEVEL PRECIPITA SIERRA MA	LAG = 0. LEY UNDEN CRE AND I OPMENTS O TION DATA DRE DEPTH	EL SELECTION .80 * TC /ELOPED" S-G. LESS; AND "V. DF 2 UNITS/A A ENTERED ON H-AREA FACTO: CONDITION (.	RAPH FOR ALLEY DEV CRE AND M SUBAREA RS USED.	DEVELOPI ELOPED" ORE. BASIS.	S-GRA	PH	RAPH	METHOD <sup>3</sup>
			************ DDE 21400.0						*****
>>>	>>>RATION	AL METHOI	O INITIAL SU	BAREA ANA	LYSIS<<	<<<			
>>> J<<	>>>RATION USE TIME-	AL METHOI	O INITIAL SU:	BAREA ANA OGRAPH FC	LYSIS<<	<<<		====	=====:
>>> >>U ===== INI ELE Tc SUE	>>>RATION USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA	AL METHOD OF-CONCEN CAREA FLOW ATA: UPST CNGTH** 3. LYSIS USE	D INITIAL SU. TRATION NOM THE PROPERTY OF T	BAREA ANA DGRAPH FC ====================================	LYSIS<< R INITI ======= 8.36 00 DOWI E)]**0	<<< AL SUB. ======  NSTREA  20 42	AREA<< ======	===== 13	====== 60.00
>>> >>U ===== INI ELE Tc SUE *	>>>RATION USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 10 YEAR	AL METHOI OF-CONCEN CONCENTATION CONCENTATIO	D INITIAL SU. TRATION NOM N-LENGTH (FEE' TREAM (FEET)	BAREA ANA DGRAPH FC ====================================	LYSIS<< R INITI 8.36 00 DOWN E)]**0.	<<< AL SUB. ======  NSTREA  20 42	AREA<< ======	13	====== 60.00
>>> >>U ===== INI ELF Tc SUF *	>>>RATION USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN	AL METHOI OF-CONCEN AREA FLOW ATA: UPST UNGTH** 3. LYSIS USE RAINFALL AND LOSS	D INITIAL SU: UTRATION NOM	BAREA ANA DGRAPH FC ======== F) = 59 = 1380.  ION CHANG C(MIN.) = NCH/HR) = MC II): L AREA	LYSIS< R INITI 8.36 00 DOWN E)]**0. 7.7 4.271	<<< AL SUB. ====== NSTREA 20 42	AREA<< ======= M(FEET) = Ap	SCS	Tc
>>> >>U INI ELE TC SUE * SUE DE RES	>>>RATION USE TIME- ======= ITIAL SUB EVATION D = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI	AL METHOL OF-CONCEN AREA FLOW ATA: UPST NGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ ISE NGS/ACRE'	D INITIAL SU:  NTRATION NOM	BAREA ANA OGRAPH FC  I) = 59 = 1380.  ION CHANG C(MIN.) = MCH/HR) = MC II): L AREA (ACRES)	LYSIS<<- R INITI. ===================================	<<< AL SUB. ====== NSTREA 20 42 /HR)	AREA<< ====== M(FEET) = Ap (DECIMAL)	SCS CN	Tc (MIN.)
>>> >>U ===== INJ ELF TC SUF * SUF DF RES	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI SIDENTIAL	AL METHOI OF-CONCEN CONCENTRATE INGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ ISE NGS/ACRE'	D INITIAL SUNTRATION NOME TO SELECT SELECTION NOME TO SELECT SELE	BAREA ANA OGRAPH FC ====================================	LYSIS<<- R INITI. ===================================	<<< AL SUB. ======= NSTREA 20 42 /HR) .75	AREA<< ====== M(FEET) =  Ap (DECIMAL) 0.600	SCS CN	Tc (MIN.)
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI SIDENTIAL DWELLING MMERCIAL BAREA AVE BAREA AVE	AL METHOD OF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-COF-CONCEN COF-COF-COF-COF-COF-COF-COF-COF-COF-COF-	O INITIAL SUNTRATION NOME TO SELECT S	BAREA ANA OGRAPH FC ====================================	LYSIS<<- R INITI. ===================================	<<< AL SUB. ====== NSTREA 20 42  /HR) .75 .75 .75 = 0.	AREA<< ======  M(FEET) =  Ap (DECIMAL)  0.600  0.700 0.100	SCS CN	Tc (MIN.
>>> >> >> >> >> >> >> >> >> >> >> >> >>	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI SIDENTIAL DWELLING MMERCIAL BAREA AVE BAREA RUN	AL METHOD OF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-COF-COF-COF-COF-COF-COF-COF-COF-COF-	D INITIAL SUNTRATION NOME TO SELECT S	BAREA ANA OGRAPH FC ====================================	LYSIS<<- R INITI: ===================================	<<< AL SUB. ====== NSTREA 20 42  /HR) .75 .75 .7575	AREA<< ======  M(FEET) =  Ap (DECIMAL)  0.600  0.700  0.100  75	SCS CN 56 56	Tc (MIN.)
>>> >>> INI ELF Tc SUE * SUE DE RESS "3- RESS "20 COM SUE	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI DWELLI DWELLING MMERCIAL BAREA AVE BAREA AVE BAREA RUN TAL AREA( BAREA ARE	AL METHOD OF-CONCEN AREA FLOW ATA: UPST NGTH** 3. LYSIS USE RAINFALL AND LOSS IT TYPE/ ISE ISS/ACRE" ISS/ACRE" ISS/ACRE" ISS/ACRE PERV ISS ACRES INGS PERV ISS ACRES I	D INITIAL SUNTRATION NOME SERVICE STREAM (FEET) STREAM (FE	BAREA ANA DGRAPH FC ====================================	LYSIS<<- R INITI: ===================================	<<< AL SUB. ====== NSTREA 20 42  /HR) .75 .75 .75 .583  CFS) =	AREA<< ======= M(FEET) =  Ap (DECIMAL) 0.600 0.700 0.100 75	SCS CN 56 56 56	Tc (MIN.; 10.4:
>>> >>> INDELIFIED TO SUFFIED TO SUFFIED TO SUFFIED SU	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI SIDENTIAL DWELLING MMERCIAL BAREA AVE BAREA RUN TAL AREA( BAREA ARE = 0.30;	AL METHOD OF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-CONCEN COF-COF-COF-COF-COF-COF-COF-COF-COF-COF-	D INITIAL SUNTRATION NOME TO SELECT STREAM (FEET):  OUT OF THE SELECT SE	BAREA ANA DGRAPH FC ====================================	LYSIS<<-R INITI. ===================================	<<< AL SUB NSTREA 20 42  /HR) .75 .75 .75 .583  CFS) = 6HR = ******	AREA<< =======  M(FEET) =  Ap (DECIMAL)  0.600  0.700  0.100  75  31.9  1.74; 24H  *********	SCS CN 56 56 56 2 R = 3	Tc (MIN.) 10.49 11.11 7.7
>>> >>> INJ ELE TC SUE * SUE TC SUE * SUE TC SUE SUE TC SUE	>>> RATION USE TIME- ======= ITIAL SUB EVATION D  = K*[(LE BAREA ANA 10 YEAR BAREA TC EVELOPMEN LAND U SIDENTIAL -4 DWELLI SIDENTIAL DWELLING MMERCIAL BAREA AVE BAREA AVE BAREA AVE BAREA ARE = 0.30;  *********** OW PROCES	AL METHOD OF-CONCEN CONCENTRATE AREA FLOW ATA: UPST AND LOSS TT TYPE/ SS/ACRE' ARAGE PERV ARAGE PER	D INITIAL SUNTRATION NOME TO THE PROPERTY OF T	BAREA ANA OGRAPH FC	LYSIS<<-R INITI. ===================================	<<< AL SUB NSTREA 20 42  /HR) .75 .75 -75 -583  CFS) = 6HR = ******	AREA<< =======  M(FEET) =  Ap (DECIMAL)  0.600  0.700  0.100  75  31.9  1.74; 24H  ***********************************	SCS CN 56 56 56 56	Tc (MIN.) 10.49 11.19 7.74

CHANNEL LENGTH THRU SUBAREA (FEET) = 415.44 CHANNEL SLOPE = 0.0578

```
CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                             31.92
 FLOW VELOCITY (FEET/SEC.) = 4.02 FLOW DEPTH (FEET) = 0.73
 TRAVEL TIME (MIN.) = 1.72 Tc (MIN.) = 9.46
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21402.00 = 1013.80 FEET.
*******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21402.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 9.46
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.786
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                          Аp
                                                  SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.47 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA (ACRES) = 3.47 SUBAREA RUNOFF (CFS) = 10.42
 EFFECTIVE AREA(ACRES) = 12.72 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 12.7 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21402.00 TO NODE 21403.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1336.00 DOWNSTREAM(FEET) = 1327.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 198.50 CHANNEL SLOPE = 0.0453
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 3.86 FLOW DEPTH (FEET) = 0.81
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 10.32
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21403.00 = 1212.30 FEET.
******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21403.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 10.32
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.594
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                           Aρ
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           3.90
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
```

```
SUBAREA AREA(ACRES) = 3.90
                          SUBAREA RUNOFF(CFS) = 11.04
 EFFECTIVE AREA(ACRES) = 16.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 16.6
                              PEAK FLOW RATE(CFS) =
                                                47.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*******************
 FLOW PROCESS FROM NODE 21403.00 TO NODE 21404.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1327.00 DOWNSTREAM(FEET) = 1310.00
 CHANNEL LENGTH THRU SUBAREA(FEET) = 389.91 CHANNEL SLOPE = 0.0436
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 47.15
 FLOW VELOCITY (FEET/SEC.) = 3.99 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 1.63 Tc (MIN.) = 11.95
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21404.00 = 1602.21 FEET.
**********************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21404.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 11.95
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.291
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                  Fр
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           3.41 0.75 0.600
                                                   56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 3.41 SUBAREA RUNOFF(CFS) = 8.72
 EFFECTIVE AREA(ACRES) = 20.03 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) = 20.0 PEAK FLOW RATE (CFS) =
                                                   51.35
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*******************
 FLOW PROCESS FROM NODE 21404.00 TO NODE 21405.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1310.00 DOWNSTREAM(FEET) = 1295.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 295.90 CHANNEL SLOPE = 0.0507
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 15.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             51.35
 FLOW VELOCITY (FEET/SEC.) = 4.32 FLOW DEPTH (FEET) = 0.89
 TRAVEL TIME (MIN.) = 1.14 Tc (MIN.) = 13.09
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 3 Date: 04/21/2014 File name: LR0214ZZ.RES

```
LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21405.00 = 1898.11 FEET.
*******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21405.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 13.09
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.116
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fp Ap SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 8.54
                                             0.600 56
                                      0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 8.54
                             SUBAREA RUNOFF (CFS) = 20.50
 EFFECTIVE AREA(ACRES) = 28.57 AREA-AVERAGED Fm(INCH/HR) = 0.44
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
 TOTAL AREA (ACRES) =
                      28.6
                             PEAK FLOW RATE(CFS) =
                                                     68.69
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21405.00 TO NODE 21406.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1295.00 DOWNSTREAM(FEET) = 1285.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 314.00 CHANNEL SLOPE = 0.0318
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 20.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              68.69
 FLOW VELOCITY (FEET/SEC.) = 3.64 FLOW DEPTH (FEET) = 0.97
 TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 14.53
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21406.00 = 2212.11 FEET.
*********************
 FLOW PROCESS FROM NODE 21406.00 TO NODE 21406.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 14.53
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.927
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Ар
                                                    SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             26.61
                                      0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 26.61
                             SUBAREA RUNOFF (CFS) = 59.35
 EFFECTIVE AREA(ACRES) = 55.18 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 TOTAL AREA (ACRES) =
                 55.2
                             PEAK FLOW RATE(CFS) = 123.18
```

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
FLOW PROCESS FROM NODE 21406.00 TO NODE 21417.00 IS CODE = 42
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1285.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
 FLOW LENGTH (FEET) = 1395.25 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY (FEET/SEC.) = 13.77
 PIPE-FLOW(CFS) = 97.40
 PIPEFLOW TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 16.22
 *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
 ESTIMATED PIPE DIAMETER (INCH) = 42.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 42.0 INCH PIPE IS 29.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.10
 PIPE-FLOW(CFS) = 123.18
 PIPEFLOW TRAVEL TIME (MIN.) = 1.36 Tc (MIN.) = 15.89
 *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
 PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
**********************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
MAINLINE Tc(MIN.) = 15.89
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.774
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                     В
                            1.06 0.75
                                           0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           5.55
                                     0.75 0.600
 MOBILE HOME PARK B 12.65
                                     0.75 0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.343
 SUBAREA AREA (ACRES) = 19.26 SUBAREA RUNOFF (CFS) = 43.64
 EFFECTIVE AREA(ACRES) = 74.44 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 74.4 PEAK FLOW RATE (CFS) =
                                                   159.22
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 5 Date: 04/21/2014 File name: LR0214ZZ.RES Page 6

```
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.89
 RAINFALL INTENSITY (INCH/HR) = 2.77
 AREA-AVERAGED Fm(INCH/HR) = 0.40
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) = 74.44
 TOTAL STREAM AREA(ACRES) = 74.44
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 159.22
******************
 FLOW PROCESS FROM NODE 21410.00 TO NODE 21411.00 IS CODE = 21
._____
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
_____
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 770.62
 ELEVATION DATA: UPSTREAM(FEET) = 1370.00 DOWNSTREAM(FEET) = 1345.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.679
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.337
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                     Fρ
                                             Аp
                                                   SCS Tc
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.87
                                     0.75
                                             0.600
                                                  56 11.68
 RESIDENTIAL
 "2 DWELLINGS/ACRE"
                     в 1.17
                                   0.75 0.700 56 12.42
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.623
 SUBAREA RUNOFF (CFS) = 13.02
 TOTAL AREA(ACRES) = 5.04 PEAK FLOW RATE(CFS) = 13.02
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21411.00 TO NODE 21412.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1345.00 DOWNSTREAM(FEET) = 1312.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 618.61 CHANNEL SLOPE = 0.0533
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              13.02
 FLOW VELOCITY (FEET/SEC.) = 2.35 FLOW DEPTH (FEET) = 0.33
 TRAVEL TIME (MIN.) = 4.39 Tc (MIN.) = 16.06
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21412.00 = 1389.23 FEET.
*****************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21412.00 IS CODE = 81
```

```
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 MAINLINE Tc(MIN.) = 16.06
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.756
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 7.50 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                             SUBAREA RUNOFF(CFS) = 15.57
 SUBAREA AREA(ACRES) = 7.50
 EFFECTIVE AREA(ACRES) = 12.54 AREA-AVERAGED Fm(INCH/HR) = 0.46
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA(ACRES) = 12.5
                              PEAK FLOW RATE(CFS) =
                                                    25.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21412.00 TO NODE 21413.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1312.00 DOWNSTREAM(FEET) = 1300.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 262.39 CHANNEL SLOPE = 0.0457
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              25.96
 FLOW VELOCITY (FEET/SEC.) = 2.60 FLOW DEPTH (FEET) = 0.45
 TRAVEL TIME (MIN.) = 1.69 Tc (MIN.) = 17.75
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21413.00 = 1651.62 FEET.
************************
 FLOW PROCESS FROM NODE 21413.00 TO NODE 21413.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 17.75
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.596
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                                   SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           1.80
                                     0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
 SUBAREA AREA(ACRES) = 1.80
                            SUBAREA RUNOFF (CFS) = 3.48
 EFFECTIVE AREA(ACRES) = 14.34 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 TOTAL AREA (ACRES) = 14.3
                              PEAK FLOW RATE(CFS) =
                                                   27.63
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
FLOW PROCESS FROM NODE 21413.00 TO NODE 21414.00 IS CODE = 54
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 7 Date: 04/21/2014 File name: LR0214ZZ.RES Page 8

```
MAINLINE Tc(MIN.) = 20.18
                                                                        * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.404
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
                                                                        SUBAREA LOSS RATE DATA (AMC II):
______
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                                                                                 αA
 ELEVATION DATA: UPSTREAM(FEET) = 1300.00 DOWNSTREAM(FEET) = 1287.00
                                                                                         GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                          LAND USE
 CHANNEL LENGTH THRU SUBAREA (FEET) = 324.82 CHANNEL SLOPE = 0.0400
                                                                        MOBILE HOME PARK
                                                                                          B 0.54 0.75 0.250
 CHANNEL BASE (FEET) = 0.00 "Z" FACTOR = 50.000
                                                                                           B 1.31 0.75 0.850
                                                                        PUBLIC PARK
 MANNING'S FACTOR = 0.045 MAXIMUM DEPTH (FEET) = 1.00
                                                                        RESIDENTIAL
                                                                        "3-4 DWELLINGS/ACRE" B 0.69 0.75 0.600
 CHANNEL FLOW THRU SUBAREA (CFS) =
 FLOW VELOCITY (FEET/SEC.) = 2.52 FLOW DEPTH (FEET) = 0.47
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 TRAVEL TIME (MIN.) = 2.15 Tc (MIN.) = 19.90
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.655
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21414.00 = 1976.44 FEET.
                                                                        SUBAREA AREA (ACRES) = 2.54 SUBAREA RUNOFF (CFS) = 4.38
                                                                        EFFECTIVE AREA(ACRES) = 22.78 AREA-AVERAGED Fm(INCH/HR) = 0.46
******************
                                                                        AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
 FLOW PROCESS FROM NODE 21414.00 TO NODE 21414.00 IS CODE = 81
                                                                        TOTAL AREA (ACRES) = 22.8 PEAK FLOW RATE (CFS) =
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
______
                                                                        5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 MAINLINE Tc(MIN.) = 19.90
                                                                       *******************
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.424
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        FLOW PROCESS FROM NODE 21415.00 TO NODE 21416.00 IS CODE = 42
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                 Fρ
                                                                       ______
    LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                        >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
 RESIDENTIAL
                                                                        >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 "3-4 DWELLINGS/ACRE" B 5.90
                                                                      _______
                                 0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                        UPSTREAM NODE ELEVATION (FEET) = 1277.00
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
                                                                        DOWNSTREAM NODE ELEVATION (FEET) = 1263.00
 SUBAREA AREA(ACRES) = 5.90 SUBAREA RUNOFF(CFS) = 10.49
                                                                        FLOW LENGTH (FEET) = 509.70 MANNING'S N = 0.013
 EFFECTIVE AREA(ACRES) = 20.24 AREA-AVERAGED Fm(INCH/HR) = 0.45
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.61
                                                                        USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 TOTAL AREA (ACRES) = 20.2 PEAK FLOW RATE (CFS) = 35.90
                                                                        DEPTH OF FLOW IN 36.0 INCH PIPE IS 15.0 INCHES
                                                                        PIPE-FLOW VELOCITY (FEET/SEC.) = 14.37
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                        PIPE-FLOW(CFS) =
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                        *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        PIPEFLOW TRAVEL TIME (MIN.) = 0.59 Tc (MIN.) = 20.77
******************
                                                                        LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21416.00 = 2749.44 FEET.
 FLOW PROCESS FROM NODE 21414.00 TO NODE 21415.00 IS CODE = 42
                                                                       >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                        FLOW PROCESS FROM NODE 21416.00 TO NODE 21416.00 IS CODE = 81
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                       ______
_____
                                                                        >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>
 UPSTREAM NODE ELEVATION (FEET) = 1287.00
                                                                       ______
 DOWNSTREAM NODE ELEVATION (FEET) = 1277.00
                                                                        MAINLINE Tc (MIN.) = 20.77
 FLOW LENGTH (FEET) = 263.30 MANNING'S N = 0.013
                                                                        * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.362
                                                                        SUBAREA LOSS RATE DATA (AMC II):
                                                                        DEVELOPMENT TYPE/ SCS SOIL AREA
 USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
                                                                                                        Fρ
 DEPTH OF FLOW IN 36.0 INCH PIPE IS 12.9 INCHES
                                                                          LAND USE
                                                                                          GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                                 2.38 0.75 0.250 56
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.71
                                                                        MOBILE HOME PARK
                                                                                           В
 PIPE-FLOW(CFS) = 35.90
                                                                        PUBLIC PARK
                                                                                            В
                                                                                                   2.15
                                                                                                           0.75 0.850
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                        SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 20.18
                                                                        SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.535
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21415.00 = 2239.74 FEET.
                                                                        SUBAREA AREA (ACRES) = 4.53 SUBAREA RUNOFF (CFS) = 8.00
                                                                        EFFECTIVE AREA(ACRES) = 27.31 AREA-AVERAGED Fm(INCH/HR) = 0.45
******************
                                                                        AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.60
 FLOW PROCESS FROM NODE 21415.00 TO NODE 21415.00 IS CODE = 81
                                                                        TOTAL AREA (ACRES) = 27.3 PEAK FLOW RATE (CFS) =
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                        SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
_____
                                                                        5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
```

SCS

56

56

39.91

47.06

Date: 04/21/2014 File name: LR0214ZZ.RES Date: 04/21/2014 File name: LR0214ZZ.RES Page 10 Page 9

```
************************
                                                                          ** CONFLUENCE DATA **
 FLOW PROCESS FROM NODE 21416.00 TO NODE 21417.00 IS CODE = 42
                                                                          STREAM
                                                                                   0
                                                                                        Tc Intensity Fp(Fm) Ap Ae HEADWATER
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                          NUMBER
                                                                                 (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                           1 159.22 15.89 2.774 0.75(0.40) 0.53 74.4 21400.00
                                                                                 48.71 21.21 2.333 0.75(0.44) 0.59 28.6 21410.00
 UPSTREAM NODE ELEVATION (FEET) = 1263.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1250.00
                                                                          RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 FLOW LENGTH (FEET) = 417.28 MANNING'S N = 0.013
                                                                          CONFLUENCE FORMULA USED FOR 2 STREAMS.
                                                                          ** PEAK FLOW RATE TABLE **
 USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 39.0 INCH PIPE IS 15.2 INCHES
                                                                          STREAM
                                                                                 Q Tc Intensity Fp(Fm) Ap Ae HEADWATER
 PIPE-FLOW VELOCITY (FEET/SEC.) = 15.67
                                                                                   (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                          NUMBER
 PIPE-FLOW(CFS) =
                 47.06
                                                                           1
                                                                                  204.23 15.89 2.774 0.75(0.41) 0.54 95.9 21400.00
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
                                                                                  178.37 21.21 2.333 0.75(0.41) 0.55 103.1 21410.00
 PIPEFLOW TRAVEL TIME (MIN.) = 0.44 Tc (MIN.) = 21.21
 LONGEST FLOWPATH FROM NODE 21410.00 TO NODE 21417.00 = 3166.72 FEET.
                                                                          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                          PEAK FLOW RATE (CFS) = 204.23 Tc (MIN.) = 15.89
******************
                                                                          EFFECTIVE AREA(ACRES) = 95.88 AREA-AVERAGED Fm(INCH/HR) = 0.41
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 81
                                                                          AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.54
______
                                                                          TOTAL AREA (ACRES) = 103.1
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                          LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21417.00 = 3607.36 FEET.
______
                                                                        ******************
 MAINLINE Tc(MIN.) = 21.21
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.333
                                                                          FLOW PROCESS FROM NODE 21417.00 TO NODE 21418.00 IS CODE = 42
 SUBAREA LOSS RATE DATA (AMC II):
                                                                        ______
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fp Ap SCS
                                                                         >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                         >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 COMMERCIAL
                    B
                           0.24
                                  0.75
                                           0.100 56
                                                                        _____
 RESIDENTIAL
                                                                         UPSTREAM NODE ELEVATION (FEET) = 1250.00
 "3-4 DWELLINGS/ACRE" B 0.73 MOBILE HOME PARK B 0.34
                                     0.75
                                            0.600
                                                 56
                                                                          DOWNSTREAM NODE ELEVATION (FEET) = 1218.00
                                    0.75
                                            0.250
                                                                          FLOW LENGTH (FEET) = 2374.87 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.418
                                                                          USER SPECIFIED PIPE DIAMETER (INCH) = 51.00 NUMBER OF PIPES = 1
 SUBAREA AREA(ACRES) = 1.31 SUBAREA RUNOFF(CFS) = 2.38
                                                                          USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 EFFECTIVE AREA(ACRES) = 28.62 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                          PIPE-FLOW VELOCITY(FEET/SEC.) = 12.73
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.59
                                                                          PIPE-FLOW(CFS) = 180.72
 TOTAL AREA(ACRES) = 28.6
                            PEAK FLOW RATE(CFS) =
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 3.11 Tc (MIN.) = 19.00
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                          *DEFICIENCY ANALYSIS (BASED ON REPLACEMENT SYSTEM HYDROLOGY):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                          *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
                                                                          ESTIMATED PIPE DIAMETER (INCH) = 54.00 NUMBER OF PIPES = 1
******************
                                                                          DEPTH OF FLOW IN 54.0 INCH PIPE IS 42.9 INCHES
 FLOW PROCESS FROM NODE 21417.00 TO NODE 21417.00 IS CODE = 1
                                                                          PIPE-FLOW VELOCITY (FEET/SEC.) = 15.08
______
                                                                          PIPE-FLOW(CFS) = 204.23
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<
                                                                          PIPEFLOW TRAVEL TIME (MIN.) = 2.63 Tc(MIN.) = 18.52
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
                                                                          *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
 TOTAL NUMBER OF STREAMS = 2
                                                                          PIPE DIAMETER (INCH) = 24.00 NUMBER OF PIPES = 1
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
                                                                          LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET.
 TIME OF CONCENTRATION (MIN.) = 21.21
                                                                        ******************
 RAINFALL INTENSITY (INCH/HR) = 2.33
 AREA-AVERAGED Fm(INCH/HR) = 0.44
                                                                          FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.59
                                                                         >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 EFFECTIVE STREAM AREA(ACRES) = 28.62
                                                                        TOTAL STREAM AREA(ACRES) = 28.62
                                                                         MAINLINE Tc(MIN.) = 18.52
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Date: 04/21/2014 File name: LR0214ZZ.RES Page 12

PEAK FLOW RATE (CFS) AT CONFLUENCE =

48.71

```
* 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.531
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                Fρ
                GROUP (ACRES) (INCH/HR) (DECIMAL) CN
    LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                        3.88
                               0.75 0.600 56
 COMMERCIAL
                  В
                        9.63
                                0.75
                                       0.100 56
 MOBILE HOME PARK B 29.24
                                0.75
                                     0.250 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.248
 SUBAREA AREA (ACRES) = 42.75
                         SUBAREA RUNOFF (CFS) = 90.24
 EFFECTIVE AREA(ACRES) = 138.63 AREA-AVERAGED Fm(INCH/HR) = 0.34
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.45
                         PEAK FLOW RATE (CFS) = 273.49
 TOTAL AREA (ACRES) = 145.8
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 10
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
_____
******************
 FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 15.1
 >>>>DEFINE MEMORY BANK # 2 <<<<
______
 PEAK FLOWRATE TABLE FILE NAME: 21378.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1389.13 Tc (MIN.) = 36.49
 AREA-AVERAGED Fm(INCH/HR) = 0.44 Ybar = 0.56
 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 14.0
______
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 1389.13 Tc (MIN.) = 36.49
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.56
 TOTAL AREA (ACRES) = 2153.6
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21378.00 = 18071.79 FEET.
FLOW PROCESS FROM NODE 21378.00 TO NODE 21378.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
FLOW PROCESS FROM NODE 21378.00 TO NODE 21418.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1218.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1235.33 CHANNEL SLOPE = 0.0138
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 1389.13
 FLOW VELOCITY (FEET/SEC.) = 20.71 FLOW DEPTH (FEET) = 3.39
 TRAVEL TIME (MIN.) = 0.99 Tc (MIN.) = 37.48
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc(MIN.) = 37.48
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.658
 SUBAREA LOSS RATE DATA(AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                   Fρ
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                             7.20
                                      0.75 0.600
                                                     56
                     В 26.95
 COMMERCIAL
                                   0.75
                                             0.100
                                                     56
 MOBILE HOME PARK
                     В 13.18
                                      0.75
                                              0.250
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.218
 SUBAREA AREA (ACRES) = 47.33
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.80;24H= 3.39
 S-GRAPH: VALLEY(DEV.) = 96.4%; VALLEY(UNDEV.)/DESERT= 3.6%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.44; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.99; 6HR = 0.99; 24HR = 1.00
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2201.0
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0329; Lca/L=0.4,n=.0295; Lca/L=0.5,n=.0271; Lca/L=0.6,n=.0253
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 299.72
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1417.19
 TOTAL AREA(ACRES) = 2201.0 PEAK FLOW RATE(CFS) = 1417.19
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*******************
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
_____
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1417.19 Tc (MIN.) = 37.48
 AREA-AVERAGED Fm (INCH/HR) = 0.44 Ybar = 0.55
 TOTAL AREA (ACRES) = 2201.0
```

LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.

File name: LR0214ZZ.RES

Page 14

Date: 04/21/2014

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>

```
** MEMORY BANK # 1 CONFLUENCE DATA **
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
  STREAM
           0
                 Tc Intensity Fp(Fm) Ap Ae HEADWATER
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.189
  NUMBER
           (CFS) (MIN.) (INCH/HR) (INCH/HR) (ACRES) NODE
                                                                             SUBAREA AREA (ACRES) = 123.42
    1
          273.49 18.52 2.531 0.75(0.34) 0.45 138.6 21400.00
                                                                             UNIT-HYDROGRAPH DATA:
    2
          239.56 23.94 2.169 0.75(0.34) 0.46 145.8 21410.00
                                                                             RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.80;24H= 3.36
 LONGEST FLOWPATH FROM NODE 21400.00 TO NODE 21418.00 = 5982.23 FEET.
                                                                             S-GRAPH: VALLEY(DEV.) = 96.8%; VALLEY(UNDEV.) / DESERT = 3.2%
                                                                                    MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
                                                                             Tc(HR) = 0.65; LAG(HR) = 0.52; Fm(INCH/HR) = 0.42; Ybar = 0.53
 UNIT-HYDROGRAPH DATA:
                                                                             USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.80;24H= 3.38
                                                                             DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;
                                                                             3HR = 0.98; 6HR = 0.99; 24HR = 1.00
 S-GRAPH: VALLEY (DEV.) = 96.6%; VALLEY (UNDEV.) / DESERT = 3.4%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                             UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2470.2
                                                                             LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
 Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.43; Ybar = 0.55
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                             EOUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                             Lca/L=0.3,n=.0316; Lca/L=0.4,n=.0283; Lca/L=0.5,n=.0260; Lca/L=0.6,n=.0243
 DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;
 3HR = 0.98; 6HR = 0.99; 24HR = 1.00
                                                                             TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 346.42
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2346.8
                                                                             UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1564.88
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21418.00 = 19307.12 FEET.
                                                                             TOTAL AREA (ACRES) = 2470.2 PEAK FLOW RATE (CFS) = 1564.88
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0329; Lca/L=0.4,n=.0295; Lca/L=0.5,n=.0271;Lca/L=0.6,n=.0253
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 321.10
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 PEAK FLOW RATE(CFS) = 1506.08
                                                                           *************************
******************
                                                                             FLOW PROCESS FROM NODE 21419.00 TO NODE 21420.00 IS CODE = 48
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21418.00 IS CODE = 12
                                                                             >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>CLEAR MEMORY BANK # 1 <<<<<
                                                                             >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <>>>
                                                                           ______
______
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1200.00 DOWNSTREAM(FEET) = 1170.00
******************
                                                                             FLOW LENGTH (FEET) = 3014.53 MANNING'S N = 0.014
 FLOW PROCESS FROM NODE 21418.00 TO NODE 21419.00 IS CODE = 54
                                                                             GIVEN BOX BASEWIDTH (FEET) = 19.00 GIVEN BOX HEIGHT (FEET) = 5.00
                                                                             *GIVEN BOX HEIGHT(FEET) = 5.00 ESTIMATED BOX BASEWIDTH(FEET) = 20.17
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             ASSUME FULL-FLOWING BOX BOX-FLOW VELOCITY (FEET/SEC.) = 15.52
                                                                             BOX-FLOW(CFS) = 1564.88
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
                                                                             BOX-FLOW TRAVEL TIME (MIN.) = 3.24 Tc (MIN.) = 42.52
 ELEVATION DATA: UPSTREAM(FEET) = 1218.00 DOWNSTREAM(FEET) = 1200.00
                                                                             LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21420.00 = 24292.93 FEET.
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1971.28 CHANNEL SLOPE = 0.0091
                                                                           ******************
 CHANNEL BASE (FEET) = 13.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 6.50
                                                                             FLOW PROCESS FROM NODE 21420.00 TO NODE 21420.00 IS CODE = 81
 CHANNEL FLOW THRU SUBAREA(CFS) = 1506.08
 FLOW VELOCITY (FEET/SEC.) = 18.30 FLOW DEPTH (FEET) = 3.94
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                           _____
 TRAVEL TIME (MIN.) = 1.80 Tc (MIN.) = 39.28
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21419.00 = 21278.40 FEET.
                                                                             MAINLINE Tc(MIN.) = 42.52
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.537
********************
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 FLOW PROCESS FROM NODE 21419.00 TO NODE 21419.00 IS CODE = 81
                                                                             DEVELOPMENT TYPE/
                                                                                                SCS SOIL AREA
                                                                                                               Fρ
                                                                                LAND USE
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
                                                                             COMMERCIAL
                                                                                                  В
                                                                                                         73.53
                                                                                                                  0.75
______
                                                                             MOBILE HOME PARK
                                                                                                         59.58
                                                                                                                  0.75
 MAINLINE Tc(MIN.) = 39.28
                                                                             RESIDENTIAL
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.612
                                                                             "3-4 DWELLINGS/ACRE"
                                                                                                 B 44.41
                                                                                                                  0.75
 SUBAREA LOSS RATE DATA(AMC II):
                                                                             PUBLIC PARK
                                                                                                   B 28.10
                                                                                                                  0.75
                                             Аp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fр
                                                    SCS
                                                                             RESIDENTIAL
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             "8-10 DWELLINGS/ACRE"
                                                                                                B 24.44
                                                                                                                  0.75
 RESIDENTIAL
                                                                             RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                    В 13.22
                                      0.75
                                              0.600
                                                   56
                                                                             "2 DWELLINGS/ACRE"
                                                                                                   В
                                                                                                        4.29
                                                                                                                  0.75 0.700
 COMMERCIAL
                       В
                             80.88
                                      0.75
                                              0.100 56
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
```

Date: 04/21/2014

File name: LR021477.RFS

Date: 04/21/2014 File name: LR021477.RFS Page 16

αA

0.100

0.250

0.600

0.850

0.400

56

56

56

56

56

56

B 29.32 0.75 0.250

56

MOBILE HOME PARK

```
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.365
 SUBAREA AREA(ACRES) = 234.35
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.79;24H= 3.34
 S-GRAPH: VALLEY(DEV.) = 97.1%; VALLEY(UNDEV.) / DESERT = 2.9%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.40; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 2704.5
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21420.00 = 24292.93 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0304; Lca/L=0.4,n=.0272; Lca/L=0.5,n=.0250; Lca/L=0.6,n=.0234
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 385.34
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1600.84
 TOTAL AREA (ACRES) = 2704.5 PEAK FLOW RATE (CFS) = 1600.84
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*******************
 FLOW PROCESS FROM NODE 21420.00 TO NODE 21421.00 IS CODE = 48
 >>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<
 >>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1170.00 DOWNSTREAM(FEET) = 1159.00
 FLOW LENGTH (FEET) = 874.60 MANNING'S N = 0.014
 GIVEN BOX BASEWIDTH (FEET) = 19.00 GIVEN BOX HEIGHT (FEET) = 5.00
 FLOWDEPTH IN BOX IS 3.69 FEET BOX-FLOW VELOCITY (FEET/SEC.) = 22.83
 BOX-FLOW(CFS) = 1600.84
 BOX-FLOW TRAVEL TIME (MIN.) = 0.64 Tc (MIN.) = 43.15
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE Tc(MIN.) = 43.15
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.523
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA FO
     LAND USE
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 PUBLIC PARK
                      В
                                0.85
                                        0.75
                                                 0.850
 COMMERCIAL
                                0.87
                                         0.75
                                                 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                     В
                              0.17
                                         0.75
                                                 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.482
 SUBAREA AREA(ACRES) = 1.89
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.79;24H= 3.34
 S-GRAPH: VALLEY(DEV.) = 97.1%; VALLEY(UNDEV.) / DESERT = 2.9%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 0.72; LAG(HR) = 0.58; Fm(INCH/HR) = 0.40; Ybar = 0.52
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
```

```
DEPTH-AREA FACTORS: 5M = 0.88; 30M = 0.88; 1HR = 0.88;
 3HR = 0.98; 6HR = 0.99; 24HR = 0.99
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2706.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0299; Lca/L=0.4, n=.0268; Lca/L=0.5, n=.0246; Lca/L=0.6, n=.0230
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 385.61
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 1577.07
 TOTAL AREA (ACRES) = 2706.4 PEAK FLOW RATE (CFS) = 1600.84
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
**********************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 10
______
 >>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<
______
**********************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 15.1
______
 >>>>DEFINE MEMORY BANK # 2 <<<<
PEAK FLOWRATE TABLE FILE NAME: 21070.DNA
 MEMORY BANK # 2 DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3521.80 Tc (MIN.) = 62.10
 AREA-AVERAGED Fm(INCH/HR) = 0.50 Ybar = 0.58
 TOTAL AREA(ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 14.0
 >>>>MEMORY BANK # 2 COPIED ONTO MAIN-STREAM MEMORY<
______
 MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
 PEAK FLOW RATE (CFS) = 3521.80 Tc (MIN.) = 62.10
 AREA-AVERAGED Fm(INCH/HR) = 0.50 Ybar = 0.58
 TOTAL AREA(ACRES) = 11023.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21070.00 = 47862.35 FEET.
******************
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21070.00 IS CODE = 12
 >>>>CLEAR MEMORY BANK # 2 <<<<
 FLOW PROCESS FROM NODE 21070.00 TO NODE 21421.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
______
 ELEVATION DATA: UPSTREAM(FEET) = 1183.00 DOWNSTREAM(FEET) = 1159.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1867.34 CHANNEL SLOPE = 0.0129
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 17 Date: 04/21/2014 File name: LR0214ZZ.RES Page 18

```
CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 3521.80
 FLOW VELOCITY (FEET/SEC.) = 25.31 FLOW DEPTH (FEET) = 4.73
 TRAVEL TIME (MIN.) = 1.23 Tc (MIN.) = 63.33
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
_____
 MAINLINE TC (MIN.) = 63.33
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.210
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                     Fρ
                                              Ap SCS
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                       В
                               51.49
                                        0.75
                                                0.100
 COMMERCIAL
 RESIDENTIAL
                    В
 "3-4 DWELLINGS/ACRE"
                              5.09
                                        0.75
                                                0.600
                                                      56
                        В
                                3.37
                                        0.75
                                                0.850 56
 PUBLIC PARK
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.185
 SUBAREA AREA (ACRES) = 59.95
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.03;24H= 4.14
 S-GRAPH: VALLEY(DEV.) = 71.9%; VALLEY(UNDEV.) / DESERT = 28.1%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.06; LAG(HR) = 0.84; Fm(INCH/HR) = 0.49; Ybar = 0.58
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
  EOUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0280; Lca/L=0.4,n=.0251; Lca/L=0.5,n=.0230; Lca/L=0.6,n=.0215
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 1641.52
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 3467.95
 TOTAL AREA(ACRES) = 11083.8
                                PEAK FLOW RATE (CFS) = 3521.80
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 11
 >>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY
______
 ** MAIN STREAM CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 3521.80 Tc (MIN.) = 63.33
 AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.58
 TOTAL AREA(ACRES) = 11083.8
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 ** MEMORY BANK # 1 CONFLUENCE DATA **
 PEAK FLOW RATE (CFS) = 1600.84 Tc (MIN.) = 43.15
```

```
AREA-AVERAGED Fm(INCH/HR) = 0.40 	 Ybar = 0.52
 TOTAL AREA(ACRES) = 2706.4
 LONGEST FLOWPATH FROM NODE 21100.00 TO NODE 21421.00 = 25167.53 FEET.
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.98
 S-GRAPH: VALLEY (DEV.) = 76.8%; VALLEY (UNDEV.) / DESERT= 23.2%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.06; LAG(HR) = 0.84; Fm(INCH/HR) = 0.48; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13790.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21421.00 = 49729.69 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0280; Lca/L=0.4,n=.0251; Lca/L=0.5,n=.0230; Lca/L=0.6,n=.0215
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 1999.02
 PEAK FLOW RATE (CFS) = 4162.48
**********************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21421.00 IS CODE = 12
______
 >>>>CLEAR MEMORY BANK # 1 <<<<<
______
******************
 FLOW PROCESS FROM NODE 21421.00 TO NODE 21422.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1159.00 DOWNSTREAM(FEET) = 1153.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 938.13 CHANNEL SLOPE = 0.0064
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 4162.48
 FLOW VELOCITY (FEET/SEC.) = 20.66 FLOW DEPTH (FEET) = 6.21
 TRAVEL TIME (MIN.) = 0.76 Tc (MIN.) = 64.09
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
*****************
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21422.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 64.09
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.202
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                    SCS SOIL AREA
                                                   SCS
                                     Fρ
                                             αA
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                      В
                             65.40
                                      0.75
                                             0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                           1.90
                                     0.75
                                             0.600
                                                    56
                      В
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"
                     В
                           4.85
                                     0.75
                                             0.200
                                                    56
 PUBLIC PARK
                              2.00
                                      0.75
                                             0.850
                                                    56
 RESIDENTIAL
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 19 Date: 04/21/2014 File name: LR0214ZZ.RES

```
"8-10 DWELLINGS/ACRE" B 47.14 0.75 0.400 56
                                                                               UNIT-HYDROGRAPH DATA:
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.241
                                                                               S-GRAPH: VALLEY(DEV.) = 77.1%; VALLEY(UNDEV.) / DESERT = 22.9%
 SUBAREA AREA(ACRES) = 121.29
                                                                                       MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                               Tc(HR) = 1.08; LAG(HR) = 0.86; Fm(INCH/HR) = 0.47; Ybar = 0.57
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
                                                                               USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 S-GRAPH: VALLEY(DEV.) = 77.0%; VALLEY(UNDEV.) / DESERT = 23.0%
                                                                               DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
                                                                               3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 Tc(HR) = 1.07; LAG(HR) = 0.85; Fm(INCH/HR) = 0.47; Ybar = 0.57
                                                                               UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13932.8
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.62; 1HR = 0.63;
                                                                                EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                                Lca/L=0.3, n=.0277; Lca/L=0.4, n=.0248; Lca/L=0.5, n=.0228; Lca/L=0.6, n=.0213
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13911.6
                                                                               TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2026.74
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21422.00 = 50667.82 FEET.
                                                                               UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4223.43
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
                                                                               TOTAL AREA (ACRES) = 13932.8 PEAK FLOW RATE (CFS) = 4223.43
  Lca/L=0.3,n=.0278; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0229; Lca/L=0.6,n=.0214
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2022.63
                                                                               SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4216.10
                                                                               5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 TOTAL AREA (ACRES) = 13911.6 PEAK FLOW RATE (CFS) = 4216.10
                                                                              ******************
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                FLOW PROCESS FROM NODE 21423.00 TO NODE 21439.00 IS CODE = 54
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                              ______
                                                                               >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
*********************
                                                                               >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 FLOW PROCESS FROM NODE 21422.00 TO NODE 21423.00 IS CODE = 54
                                                                              ______
                                                                               ELEVATION DATA: UPSTREAM(FEET) = 1148.00 DOWNSTREAM(FEET) = 1143.00
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                               CHANNEL LENGTH THRU SUBAREA (FEET) = 702.31 CHANNEL SLOPE = 0.0071
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                               CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
_____
                                                                               MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 ELEVATION DATA: UPSTREAM(FEET) = 1153.00 DOWNSTREAM(FEET) = 1148.00
                                                                               CHANNEL FLOW THRU SUBAREA (CFS) = 4223.43
 CHANNEL LENGTH THRU SUBAREA (FEET) = 670.94 CHANNEL SLOPE = 0.0075
                                                                               FLOW VELOCITY (FEET/SEC.) = 21.57 FLOW DEPTH (FEET) = 6.09
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
                                                                               TRAVEL TIME (MIN.) = 0.54 Tc (MIN.) = 65.14
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
                                                                               LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
 CHANNEL FLOW THRU SUBAREA(CFS) = 4216.10
 FLOW VELOCITY (FEET/SEC.) = 21.92 FLOW DEPTH (FEET) = 6.01
                                                                              *************************
 TRAVEL TIME (MIN.) = 0.51 Tc (MIN.) = 64.60
                                                                               FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21423.00 = 51338.76 FEET.
                                                                               >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<>>>
FLOW PROCESS FROM NODE 21423.00 TO NODE 21423.00 IS CODE = 81
                                                                               MAINLINE Tc(MIN.) = 65.14
                                                                               * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.190
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
                                                                               SUBAREA LOSS RATE DATA (AMC II):
_____
                                                                                DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                     Fρ
                                                                                                                               Αp
                                                                                                                                     SCS
 MAINLINE Tc(MIN.) = 64.60
                                                                                   LAND USE
                                                                                                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 1.196
                                                                               RESIDENTIAL
 SUBAREA LOSS RATE DATA (AMC II):
                                                                               "3-4 DWELLINGS/ACRE"
                                                                                                         0.52
                                                                                                                      0.75
                                                                                                                              0.600
                                                                                                                                      56
                                                                                                    В
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                       Fρ
                                              Ар
                                                      SCS
                                                                               PUBLIC PARK
                                                                                                             1.21
                                                                                                                      0.75
                                                                                                                              0.850
                                                                                                                                     56
                                                                                                      В
                                                                                                             4.21
                                                                                                                              0.250
                                                                                                                                     56
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                               MOBILE HOME PARK
                                                                                                                      0.75
 RESIDENTIAL
                                                                               SCHOOL
                                                                                                      В
                                                                                                             0.18
                                                                                                                      0.75
                                                                                                                              0.600
                                                                                                                                      56
 "3-4 DWELLINGS/ACRE"
                     R
                             1.99
                                        0.75
                                               0.600 56
                                                                               COMMERCIAL
                                                                                                             0.96
                                                                                                                      0.75
                                                                                                                              0.100
 COMMERCIAL
                        В
                              11.78
                                        0.75
                                               0.100 56
                                                                               RESIDENTIAL
                             4.78
                                                                               "11+ DWELLINGS/ACRE" B 0.39
 MOBILE HOME PARK
                       В
                                        0.75
                                               0.250
                                                                                                                      0.75
                                                                                                                             0.200
 PUBLIC PARK
                               1.74
                                        0.75
                                               0.850
                                                                               SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 RESIDENTIAL
                                                                               SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.358
 "11+ DWELLINGS/ACRE"
                      в 0.99
                                        0.75
                                               0.200 56
                                                                               SUBAREA AREA(ACRES) = 7.47
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
                                                                               UNIT-HYDROGRAPH DATA:
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.246
                                                                               RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
 SUBAREA AREA(ACRES) = 21.28
                                                                               S-GRAPH: VALLEY(DEV.) = 77.1%; VALLEY(UNDEV.)/DESERT= 22.9%
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 21

File name: LR0214ZZ.RES Page 22

Date: 04/21/2014

```
MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.09; LAG(HR) = 0.87; Fm(INCH/HR) = 0.47; Ybar = 0.57
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 13940.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0276; Lca/L=0.4,n=.0247; Lca/L=0.5,n=.0227; Lca/L=0.6,n=.0212
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2027.98
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 4217.35
 TOTAL AREA(ACRES) = 13940.3
                           PEAK FLOW RATE (CFS) = 4223.43
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*****
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 1
    ______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 4223.43 Tc (MIN.) = 65.14
 AREA-AVERAGED Fm(INCH/HR) = 0.47 Ybar = 0.57
 TOTAL AREA(ACRES) = 13940.3
******************
 FLOW PROCESS FROM NODE 21430.00 TO NODE 21431.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 200.00
 ELEVATION DATA: UPSTREAM(FEET) = 1220.00 DOWNSTREAM(FEET) = 1214.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 5.103
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 5.484
 SUBAREA To AND LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                  Fρ
                                           Ap SCS Tc
     LAND USE
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.20
                                            0.500
                                                  56 6.53
                                     0.75
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                   В 2.38
                                     0.75
                                            0.600
                                                  56 6.92
                             3.33
                                            0.100 56 5.10
 COMMERCIAL
                      В
                                     0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.315
 SUBAREA RUNOFF (CFS) = 27.92
 TOTAL AREA(ACRES) = 5.91 PEAK FLOW RATE(CFS) = 27.92
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21431.00 TO NODE 21432.00 IS CODE = 63
```

```
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1214.00 DOWNSTREAM ELEVATION(FEET) = 1209.00
 STREET LENGTH (FEET) = 286.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.03
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                  42.35
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.61
  HALFSTREET FLOOD WIDTH (FEET) = 22.48
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.04
  PRODUCT OF DEPTH&VELOCITY (FT*FT/SEC.) = 2.46
 STREET FLOW TRAVEL TIME (MIN.) = 1.18 Tc (MIN.) = 6.28
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 4.840
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp
                                                      SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                     B 0.32 0.75
                                               0.500
                                                       56
 COMMERCIAL
                       B 5.86 0.75 0.100
                                                       56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.61 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.164
 SUBAREA AREA (ACRES) = 6.79 SUBAREA RUNOFF (CFS) = 28.83
 EFFECTIVE AREA(ACRES) = 12.70 AREA-AVERAGED Fm(INCH/HR) = 0.18
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.23
 TOTAL AREA(ACRES) = 12.7 PEAK FLOW RATE(CFS) =
                                                        53.33
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65 HALFSTREET FLOOD WIDTH(FEET) = 24.59
 FLOW VELOCITY (FEET/SEC.) = 4.28 DEPTH*VELOCITY (FT*FT/SEC.) = 2.78
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21432.00 = 486.00 FEET.
******************
 FLOW PROCESS FROM NODE 21432.00 TO NODE 21433.00 IS CODE = 63
______
>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
>>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1209.00 DOWNSTREAM ELEVATION(FEET) = 1206.00
 STREET LENGTH (FEET) = 254.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
```

File name: LR021477.RFS

Page 24

Date: 04/21/2014

```
DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.73
   HALFSTREET FLOOD WIDTH (FEET) = 32.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 3.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.83
 STREET FLOW TRAVEL TIME (MIN.) = 1.10 Tc (MIN.) = 7.38
  * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 4.394
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                               Αp
                                                        SCS
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.33
                                      0.75 0.500 56
                      В 5.82
 COMMERCIAL
                                         0.75 0.100 56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.58
                                        0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.163
 SUBAREA AREA (ACRES) = 6.73 SUBAREA RUNOFF (CFS) = 25.88
 EFFECTIVE AREA(ACRES) = 19.43 AREA-AVERAGED Fm(INCH/HR) = 0.16
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.21
 TOTAL AREA (ACRES) = 19.4 PEAK FLOW RATE (CFS) = 74.10
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76 HALFSTREET FLOOD WIDTH(FEET) = 34.53
 FLOW VELOCITY (FEET/SEC.) = 3.95 DEPTH*VELOCITY (FT*FT/SEC.) = 2.99
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21433.00 = 740.00 FEET.
*******************
 FLOW PROCESS FROM NODE 21433.00 TO NODE 21434.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION(FEET) = 1206.00 DOWNSTREAM ELEVATION(FEET) = 1202.00
 STREET LENGTH (FEET) = 349.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
```

```
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.81
   HALFSTREET FLOOD WIDTH (FEET) = 39.69
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.27
 STREET FLOW TRAVEL TIME (MIN.) = 1.44 Tc (MIN.) = 8.82
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.948
 SUBAREA LOSS RATE DATA (AMC II):
                                       Fp
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                          SCS
      LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.43 0.75 COMMERCIAL B 8.62 0.75
                                                  0.500
                                                          56
                                         0.75 0.100
                                                          56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 0.86 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.161
 SUBAREA AREA(ACRES) = 9.91 SUBAREA RUNOFF(CFS) = 34.14
 EFFECTIVE AREA(ACRES) = 29.34 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
 TOTAL AREA(ACRES) = 29.3 PEAK FLOW RATE(CFS) = 100.45
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.83 HALFSTREET FLOOD WIDTH(FEET) = 41.87
 FLOW VELOCITY (FEET/SEC.) = 4.12 DEPTH*VELOCITY (FT*FT/SEC.) = 3.43
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21434.00 = 1089.00 FEET.
******************
 FLOW PROCESS FROM NODE 21434.00 TO NODE 21435.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1202.00 DOWNSTREAM ELEVATION(FEET) = 1195.00
 STREET LENGTH (FEET) = 602.00 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.89
```

File name: LR0214ZZ.RES

Page 26

Date: 04/21/2014

```
HALFSTREET FLOOD WIDTH (FEET) = 47.97
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.33
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.86
 STREET FLOW TRAVEL TIME (MIN.) = 2.32 Tc (MIN.) = 11.14
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.432
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp
     LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESTDENTIAL
                                                                                 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 0.83
                                        0.75
                                                0.500 56
                      в 16.10
                                                0.100 56
 COMMERCIAL
                                        0.75
 RESIDENTIAL
                    B 2.38 0.75 0.600 56
 "3-4 DWELLINGS/ACRE"
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.179
 SUBAREA AREA (ACRES) = 19.31 SUBAREA RUNOFF (CFS) = 57.33
 EFFECTIVE AREA(ACRES) = 48.65 AREA-AVERAGED Fm(INCH/HR) = 0.14
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.19
 TOTAL AREA (ACRES) = 48.7 PEAK FLOW RATE (CFS) = 144.15
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.92 HALFSTREET FLOOD WIDTH(FEET) = 50.94
 FLOW VELOCITY (FEET/SEC.) = 4.40 DEPTH*VELOCITY (FT*FT/SEC.) = 4.05
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 602.0 FT WITH ELEVATION-DROP = 7.0 FT, IS 63.0 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21435.00
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21435.00 = 1691.00 FEET.
*******************
 FLOW PROCESS FROM NODE 21435.00 TO NODE 21436.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 14 USED) <<<<
_____
 UPSTREAM ELEVATION (FEET) = 1195.00 DOWNSTREAM ELEVATION (FEET) = 1183.00
 STREET LENGTH (FEET) = 889.50 CURB HEIGHT (INCHES) = 8.0
 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 1.07
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 184.88
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.96
   HALFSTREET FLOOD WIDTH (FEET) = 53.83
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 4.79
```

```
STREET FLOW TRAVEL TIME (MIN.) = 2.98 Tc (MIN.) = 14.12
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.978
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                     SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.44
                                       0.75
                                              0.600
                     в 28.76 0.75
                                                      56
 COMMERCIAL
                                              0.100
 "5-7 DWELLINGS/ACRE" B 0.28 0.75 0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.142
 SUBAREA AREA (ACRES) = 31.48 SUBAREA RUNOFF (CFS) = 81.35
 EFFECTIVE AREA(ACRES) = 80.13 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 80.1 PEAK FLOW RATE (CFS) = 205.59
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.99 HALFSTREET FLOOD WIDTH(FEET) = 55.11
 FLOW VELOCITY (FEET/SEC.) = 5.15 DEPTH*VELOCITY (FT*FT/SEC.) = 5.09
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
     AND L = 889.5 FT WITH ELEVATION-DROP = 12.0 FT, IS 95.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21436.00
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21436.00 = 2580.50 FEET.
*******************
 FLOW PROCESS FROM NODE 21436.00 TO NODE 21437.00 IS CODE = 33
______
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
UPSTREAM NODE ELEVATION (FEET) = 1183.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1172.00
 FLOW LENGTH (FEET) = 717.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 34.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) = 17.41
 PIPE-FLOW(CFS) = 205.59
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 0.73 Tc (MIN.) = 14.85
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.889
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap
                                                     SCS
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   LAND USE
                     B 22.52 0.75 0.100
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 4.08 0.75 0.600
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.177
 SUBAREA AREA (ACRES) = 26.60 SUBAREA RUNOFF (CFS) = 65.99
 EFFECTIVE AREA(ACRES) = 106.73 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 106.7 PEAK FLOW RATE (CFS) = 265.17
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 27 Date: 04/21/2014 File name: LR0214ZZ.RES Page 28

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL (DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 59.59
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.68
   HALFSTREET FLOOD WIDTH (FEET) = 27.19
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 2.86
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21437.00 = 3297.50 FEET.
*******************
 FLOW PROCESS FROM NODE 21437.00 TO NODE 21438.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
_____
 UPSTREAM NODE ELEVATION (FEET) = 1172.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1157.00
 FLOW LENGTH (FEET) = 1061.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 DEPTH OF FLOW IN 60.0 INCH PIPE IS 42.7 INCHES
 PIPE-FLOW VELOCITY (FEET/SEC.) = 17.72
 PIPE-FLOW(CFS) = 265.17
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME (MIN.) = 1.07 Tc (MIN.) = 15.92
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.771
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                         Fρ
                                                 αA
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                               0.28
                                          0.63
                                                1.000
                        В
                                35.84
                                          0.75
                                                  0.100 56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 5.10
                                          0.75 0.600 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.168
 SUBAREA AREA(ACRES) = 41.22 SUBAREA RUNOFF(CFS) = 98.15
 EFFECTIVE AREA(ACRES) = 147.95 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 147.9 PEAK FLOW RATE (CFS) = 351.97
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 STREET CROSS-SECTION INFORMATION:
```

```
CURB HEIGHT (INCHES) = 8.0
                            STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE To :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 86.80
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.77
   HALFSTREET FLOOD WIDTH (FEET) = 36.09
  AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.38
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21438.00 = 4358.50 FEET.
FLOW PROCESS FROM NODE 21438.00 TO NODE 21439.00 IS CODE = 33
 >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
______
 UPSTREAM NODE ELEVATION (FEET) = 1157.00
 DOWNSTREAM NODE ELEVATION (FEET) = 1143.00
 FLOW LENGTH (FEET) = 895.00 MANNING'S N = 0.013
 USER SPECIFIED PIPE DIAMETER (INCH) = 60.00 NUMBER OF PIPES = 1
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) = 15.28
 PIPE-FLOW(CFS) = 300.37
 PIPEFLOW TRAVEL TIME (MIN.) = 0.98 Tc (MIN.) = 16.90
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.673
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                        Fρ
                                                  αA
                      GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                         В
                            0.33
                                          0.63
                                                 1.000
                       В 21.36
                                         0.75
                                                 0.100
                                                         56
 COMMERCIAL
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 3.94
                                         0.75
                                                          56
                                                 0.600
                               2.98
                                                 0.250
 MOBILE HOME PARK
                         В
                                         0.75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.74
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.195
 SUBAREA AREA(ACRES) = 28.61 SUBAREA RUNOFF(CFS) = 65.12
 EFFECTIVE AREA(ACRES) = 176.56 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.17
 TOTAL AREA (ACRES) = 176.6 PEAK FLOW RATE (CFS) =
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 STREET CROSS-SECTION INFORMATION:
 CURB HEIGHT (INCHES) = 8.0 STREET HALFWIDTH (FEET) = 39.00
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 20.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 29

File name: LR0214ZZ.RES

Page 30

Date: 04/21/2014

```
SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.87
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 103.79
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH (FEET) = 0.80
  HALFSTREET FLOOD WIDTH (FEET) = 39.06
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 4.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 3.77
 LONGEST FLOWPATH FROM NODE 21430.00 TO NODE 21439.00 = 5253.50 FEET.
*****************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21439.00 IS CODE = 1
______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 16.90
 RAINFALL INTENSITY (INCH/HR) = 2.67
 AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.17
 EFFECTIVE STREAM AREA(ACRES) = 176.56
 TOTAL STREAM AREA(ACRES) = 176.56
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
                       AREA
 STREAM
         O Tc
                                  HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                   NODE
   1 4223.43 65.14 13940.30 20120.00
    2.
         404.16 16.90 176.56 21430.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.39;6H= 1.98;24H= 3.96
 S-GRAPH: VALLEY (DEV.) = 77.3%; VALLEY (UNDEV.) / DESERT = 22.7%
        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.09; LAG(HR) = 0.87; Fm(INCH/HR) = 0.47; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14116.9
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21439.00 = 52041.07 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0276; Lca/L=0.4,n=.0247; Lca/L=0.5,n=.0227; Lca/L=0.6,n=.0212
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2065.24
 PEAK FLOW RATE (CFS) = 4279.97
*****************
 FLOW PROCESS FROM NODE 21439.00 TO NODE 21443.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
_____
```

```
CHANNEL LENGTH THRU SUBAREA (FEET) = 1468.88 CHANNEL SLOPE = 0.0054
 CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 4279.97
 FLOW VELOCITY (FEET/SEC.) = 19.65 FLOW DEPTH (FEET) = 6.57
 TRAVEL TIME (MIN.) = 1.25 Tc (MIN.) = 66.39
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
**********************
 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 4279.97 Tc (MIN.) = 66.39
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.56
 TOTAL AREA(ACRES) = 14116.9
******************
 FLOW PROCESS FROM NODE 21440.00 TO NODE 21441.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 665.71
 ELEVATION DATA: UPSTREAM(FEET) = 1142.00 DOWNSTREAM(FEET) = 1138.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.137
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.261
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                                SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
    LAND USE
 MOBILE HOME PARK
                   В
                          6.41 0.75
                                         0.250 56 12.59
                     В
                          0.38
                                   0.75
                                         0.850
                                                56 18.09
 PUBLIC PARK
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"
                  в 0.07
                                   0.75
                                          0.600
                                                 56 15.43
                     В 0.09
                                   0.75
                                          0.600
                                                 56 15.43
 SCHOOL
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.25
                                   0.75
                                          0.200
                                                 56 12.14
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.288
 SUBAREA RUNOFF(CFS) = 19.74
 TOTAL AREA (ACRES) = 7.20 PEAK FLOW RATE (CFS) = 19.74
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21441.00 TO NODE 21442.00 IS CODE = 63
______
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1138.00 DOWNSTREAM ELEVATION(FEET) = 1136.00
 STREET LENGTH (FEET) = 701.10 CURB HEIGHT (INCHES) = 6.0
```

ELEVATION DATA: UPSTREAM(FEET) = 1143.00 DOWNSTREAM(FEET) = 1135.00

Date: 04/21/2014 File name: LR0214ZZ.RES Page 31 Date: 04/21/2014 File name: LR0214ZZ.RES

```
STREET HALFWIDTH (FEET) = 18.00
                                                                                PIPE-FLOW VELOCITY(FEET/SEC.) = 9.04
                                                                                PIPE-FLOW(CFS) =
                                                                                                   54.52
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
                                                                                *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                PIPEFLOW TRAVEL TIME (MIN.) = 0.28 Tc (MIN.) = 17.68
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                                LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21443.00 = 1517.19 FEET.
                                                                               ******************
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                                 FLOW PROCESS FROM NODE 21443.00 TO NODE 21443.00 IS CODE = 1
                                                                               ______
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                                >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                                >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
                                                                               _____
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                                                                 TOTAL NUMBER OF STREAMS = 2
   ***STREET FLOWING FULL***
                                                                                CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                                TIME OF CONCENTRATION (MIN.) = 17.68
   STREET FLOW DEPTH (FEET) = 0.72
                                                                                RAINFALL INTENSITY (INCH/HR) = 2.60
   HALFSTREET FLOOD WIDTH (FEET) = 29.12
                                                                                AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                AREA-AVERAGED Fp (INCH/HR) = 0.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.60
                                                                                AREA-AVERAGED Ap = 0.29
 STREET FLOW TRAVEL TIME (MIN.) = 5.26 Tc (MIN.) = 17.40
                                                                                EFFECTIVE STREAM AREA(ACRES) = 25.13
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.627
                                                                                TOTAL STREAM AREA(ACRES) = 25.13
 SUBAREA LOSS RATE DATA (AMC II):
                                                                                PEAK FLOW RATE (CFS) AT CONFLUENCE = 54.52
                                                                                ** CONFLUENCE DATA **
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fρ
                                              Ap SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
                                                                                STREAM
                                                                                        0
                                                                                                Tc
                                                                                                       AREA HEADWATER
 PUBLIC PARK
                      В 1.22
                                     0.75
                                                0.850 56
                                                                                NUMBER (CFS) (MIN.) (ACRES) NODE
                      В 16.66
                                                0.250 56
                                                                                        4279.97 66.39 14116.86 20120.00
 MOBILE HOME PARK
                                        0.75
                                                                                 1
                                                                                         54.52 17.68 25.13 21440.00
 RESIDENTIAL
 "11+ DWELLINGS/ACRE" B 0.05 0.75 0.200 56
                                                                                COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.291
                                                                                UNIT-HYDROGRAPH DATA:
 SUBAREA AREA(ACRES) = 17.93 SUBAREA RUNOFF(CFS) = 38.89
                                                                                RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.39;6H= 1.98;24H= 3.96
 EFFECTIVE AREA(ACRES) = 25.13 AREA-AVERAGED Fm(INCH/HR) = 0.22
                                                                                S-GRAPH: VALLEY (DEV.) = 77.4%; VALLEY (UNDEV.) / DESERT= 22.6%
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.29
                                                                                        MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 TOTAL AREA (ACRES) = 25.1 PEAK FLOW RATE (CFS) =
                                                                                Tc(HR) = 1.11; LAG(HR) = 0.89; Fm(INCH/HR) = 0.47; Ybar = 0.56
                                                                                USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                                DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                                3HR = 0.92; 6HR = 0.96; 24HR = 0.98
                                                                                 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14142.0
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                                LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21443.00 = 53509.95 FEET.
 DEPTH(FEET) = 0.80 HALFSTREET FLOOD WIDTH(FEET) = 33.09
                                                                                 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 FLOW VELOCITY (FEET/SEC.) = 2.41 DEPTH*VELOCITY (FT*FT/SEC.) = 1.93
                                                                                 Lca/L=0.3, n=.0274; Lca/L=0.4, n=.0246; Lca/L=0.5, n=.0226; Lca/L=0.6, n=.0211
                                                                                TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2069.81
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 701.1 FT WITH ELEVATION-DROP = 2.0 FT, IS 44.0 CFS,
                                                                                PEAK FLOW RATE (CFS) = 4248.21
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21442.00
                                                                                  (UPSTREAM NODE PEAK FLOW RATE(CFS) = 4279.97)
 LONGEST FLOWPATH FROM NODE 21440.00 TO NODE 21442.00 = 1366.81 FEET.
                                                                                PEAK FLOW RATE (CFS) USED = 4279.97
******************
                                                                               ******************
 FLOW PROCESS FROM NODE 21442.00 TO NODE 21443.00 IS CODE = 42
                                                                                 FLOW PROCESS FROM NODE 21443.00 TO NODE 21453.00 IS CODE = 54
 >>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<
                                                                                >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
                                                                                >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
_____
                                                                               _____
 UPSTREAM NODE ELEVATION (FEET) = 1136.00
                                                                                 ELEVATION DATA: UPSTREAM(FEET) = 1135.00 DOWNSTREAM(FEET) = 1118.00
                                                                                CHANNEL LENGTH THRU SUBAREA (FEET) = 1571.70 CHANNEL SLOPE = 0.0108
 DOWNSTREAM NODE ELEVATION (FEET) = 1135.00
 FLOW LENGTH (FEET) = 150.38 MANNING'S N = 0.013
                                                                                CHANNEL BASE (FEET) = 20.00 "Z" FACTOR = 2.000
                                                                                MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 10.00
 USER SPECIFIED PIPE DIAMETER (INCH) = 39.00 NUMBER OF PIPES = 1
                                                                                CHANNEL FLOW THRU SUBAREA(CFS) = 4279.97
```

DEPTH OF FLOW IN 39.0 INCH PIPE IS 26.6 INCHES

File name: LR0214ZZ.RES

Date: 04/21/2014

Date: 04/21/2014 File name: LR0214ZZ.RES Page 34

FLOW VELOCITY (FEET/SEC.) = 25.16 FLOW DEPTH (FEET) = 5.49

```
TRAVEL TIME (MIN.) = 1.04 Tc (MIN.) = 67.43
                                                                              RESIDENTIAL
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
                                                                              "11+ DWELLINGS/ACRE" B 0.28 0.75 0.200
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.259
 FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
                                                                              TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 31.74
                                                                              TRAVEL TIME THRU SUBAREA BASED ON VELOCITY (FEET/SEC.) = 3.79
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE <<<<
                                                                              AVERAGE FLOW DEPTH(FEET) = 0.69 FLOOD WIDTH(FEET) = 42.65
                                                                              "V" GUTTER FLOW TRAVEL TIME (MIN.) = 3.75 Tc (MIN.) = 14.68
_____
 TOTAL NUMBER OF STREAMS = 2
                                                                              SUBAREA AREA (ACRES) = 18.93 SUBAREA RUNOFF (CFS) = 46.26
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
                                                                              EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
 PEAK FLOW RATE (CFS) = 4279.97 Tc (MIN.) = 67.43
                                                                              TOTAL AREA (ACRES) = 22.0 PEAK FLOW RATE (CFS) =
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.56
                                                                                                                                     53.78
 TOTAL AREA(ACRES) = 14142.0
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
******************
                                                                              5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
 FLOW PROCESS FROM NODE 21450.00 TO NODE 21451.00 IS CODE = 21
______
                                                                              END OF SUBAREA "V" GUTTER HYDRAULICS:
                                                                              DEPTH (FEET) = 0.78 FLOOD WIDTH (FEET) = 53.56
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
                                                                              FLOW VELOCITY (FEET/SEC.) = 4.19 DEPTH*VELOCITY (FT*FT/SEC) = 3.27
_____
                                                                              LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21452.00 = 1379.42 FEET.
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 526.00
                                                                             ******************
 ELEVATION DATA: UPSTREAM(FEET) = 1132.00 DOWNSTREAM(FEET) = 1128.00
                                                                              FLOW PROCESS FROM NODE 21452.00 TO NODE 21453.00 IS CODE = 33
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.927
                                                                              >>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.473
                                                                              >>USING USER-SPECIFIED PIPESIZE (PARALLEL/REPLACEMENT PIPESIZE ESTIMATED) <<
 SUBAREA To AND LOSS RATE DATA (AMC II):
                                                                             ______
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                             Ap SCS Tc
                                                                              UPSTREAM NODE ELEVATION (FEET) = 1119.00
     LAND USE
                     GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
                                                                              DOWNSTREAM NODE ELEVATION (FEET) = 1118.00
 MOBILE HOME PARK
                     В
                           3.07
                                    0.75 0.250 56 10.93
                                                                              FLOW LENGTH (FEET) = 197.38 MANNING'S N = 0.013
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250
                                                                              USER SPECIFIED PIPE DIAMETER (INCH) = 36.00 NUMBER OF PIPES = 1
 SUBAREA RUNOFF(CFS) = 9.08
                                                                              USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 TOTAL AREA (ACRES) = 3.07 PEAK FLOW RATE (CFS) = 9.08
                                                                              PIPE-FLOW VELOCITY(FEET/SEC.) = 6.19
                                                                              PIPE-FLOW(CFS) = 43.77
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
                                                                              PIPEFLOW TRAVEL TIME (MIN.) = 0.53 Tc (MIN.) = 15.21
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                              * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.848
                                                                              SUBAREA LOSS RATE DATA (AMC II):
********************
                                                                               DEVELOPMENT TYPE/
                                                                                                  SCS SOIL AREA
                                                                                                                   Fρ
 FLOW PROCESS FROM NODE 21451.00 TO NODE 21452.00 IS CODE = 92
                                                                                  LAND USE
                                                                                                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.00
 >>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA
                                                                              SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.000
______
                                                                              SUBAREA AREA(ACRES) = 0.00 SUBAREA RUNOFF(CFS) = 0.00
 UPSTREAM NODE ELEVATION (FEET) = 1128.00
                                                                              EFFECTIVE AREA(ACRES) = 22.00 AREA-AVERAGED Fm(INCH/HR) = 0.19
 DOWNSTREAM NODE ELEVATION (FEET) = 1119.00
                                                                              AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.26
                                                                              TOTAL AREA (ACRES) = 22.0
 CHANNEL LENGTH THRU SUBAREA (FEET) = 853.42
                                                                                                             PEAK FLOW RATE (CFS) = 53.78
 "V" GUTTER WIDTH (FEET) = 3.00 GUTTER HIKE (FEET) = 0.250
                                                                              NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
 PAVEMENT CROSSFALL (DECIMAL NOTATION) = 0.01700
                                                                              SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 MAXIMUM DEPTH(FEET) = 1.00
                                                                              5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.909
                                                                              STREET CROSS-SECTION INFORMATION:
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                    Fp
                                                                              CURB HEIGHT (INCHES) = 6.0 STREET HALFWIDTH (FEET) = 18.00
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                              DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00
     LAND USE
 RESIDENTIAL
                                                                              INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 ".4 DWELLING/ACRE"
                     В
                             0.02
                                               0.900
                                                     56
                                       0.75
                                                                              OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
 MOBILE HOME PARK
                     в 18.33
                                       0.75
                                               0.250
                                                      56
                                                                              SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 PUBLIC PARK
                              0.30
                                       0.75
                                               0.850
                                                                              MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.70
```

Date: 04/21/2014

File name: LR021477.RFS

Page 36

```
STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) = 10.01
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH (FEET) = 0.45
   HALFSTREET FLOOD WIDTH (FEET) = 16.40
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 1.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 0.81
 LONGEST FLOWPATH FROM NODE 21450.00 TO NODE 21453.00 = 1576.80 FEET.
FLOW PROCESS FROM NODE 21453.00 TO NODE 21453.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
 >>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
_____
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 15.21
 RAINFALL INTENSITY (INCH/HR) = 2.85
 AREA-AVERAGED Fm(INCH/HR) = 0.19
 AREA-AVERAGED Fp (INCH/HR) = 0.75
 AREA-AVERAGED Ap = 0.26
 EFFECTIVE STREAM AREA(ACRES) = 22.00
 TOTAL STREAM AREA(ACRES) = 22.00
 PEAK FLOW RATE (CFS) AT CONFLUENCE =
 ** CONFLUENCE DATA **
 STREAM O Tc
                        AREA HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                  NODE
   1
         4279.97 67.43 14141.99 20120.00
          53.78 15.21 22.00 21450.00
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.39;6H= 1.98;24H= 3.96
 S-GRAPH: VALLEY (DEV.) = 77.4%; VALLEY (UNDEV.) / DESERT= 22.6%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.12; LAG(HR) = 0.90; Fm(INCH/HR) = 0.47; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14164.0
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21453.00 = 55081.64 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0271; Lca/L=0.4,n=.0243; Lca/L=0.5,n=.0223; Lca/L=0.6,n=.0208
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2073.97
 PEAK FLOW RATE (CFS) = 4199.10
   (UPSTREAM NODE PEAK FLOW RATE (CFS) = 4279.97)
 PEAK FLOW RATE (CFS) USED = 4279.97
*****************
 FLOW PROCESS FROM NODE 21453.00 TO NODE 21469.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
```

```
ELEVATION DATA: UPSTREAM(FEET) = 1118.00 DOWNSTREAM(FEET) = 1117.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 519.47 CHANNEL SLOPE = 0.0019
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.50
 CHANNEL FLOW THRU SUBAREA(CFS) = 4279.97
 FLOW VELOCITY (FEET/SEC.) = 13.40 FLOW DEPTH (FEET) = 8.28
 TRAVEL TIME (MIN.) = 0.65 Tc (MIN.) = 68.07
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
**********************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<>
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
 PEAK FLOW RATE (CFS) = 4279.97 Tc (MIN.) = 68.07
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.56
 TOTAL AREA(ACRES) = 14164.0
******************
 FLOW PROCESS FROM NODE 21460.00 TO NODE 21461.00 IS CODE = 21
______
 >>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
______
 INITIAL SUBAREA FLOW-LENGTH (FEET) = 626.73
 ELEVATION DATA: UPSTREAM(FEET) = 1222.00 DOWNSTREAM(FEET) = 1219.00
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 11.633
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 3.345
 SUBAREA TC AND LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/ SCS SOIL AREA
                                   Fρ
                                                 SCS Tc
                  GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
     LAND USE
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B 2.48 0.75 0.600 56 15.77
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE" B 5.98
                                    0.75 0.500
                                                  56 14.89
                      В 1.53
                                    0.75 0.100
                                                  56 11.63
 COMMERCIAL
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.464
 SUBAREA RUNOFF (CFS) = 26.96
 TOTAL AREA (ACRES) = 9.99 PEAK FLOW RATE (CFS) = 26.96
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
FLOW PROCESS FROM NODE 21461.00 TO NODE 21462.00 IS CODE = 63
 >>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<
 >>>> (STREET TABLE SECTION # 5 USED) <<<<
______
 UPSTREAM ELEVATION(FEET) = 1219.00 DOWNSTREAM ELEVATION(FEET) = 1216.00
 STREET LENGTH (FEET) = 478.63 CURB HEIGHT (INCHES) = 6.0
 STREET HALFWIDTH (FEET) = 18.00
```

Date: 04/21/2014 File name: LR0214ZZ.RES Page 37 Date: 04/21/2014 File name: LR0214ZZ.RES Page 38

```
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                             FLOW PROCESS FROM NODE 21463.00 TO NODE 21463.00 IS CODE = 81
                                                                           ______
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
                                                                           STREET PARKWAY CROSSFALL (DECIMAL) = 0.020
                                                                             MAINLINE Tc (MIN.) = 14.88
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0180
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.886
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200
                                                                             SUBAREA LOSS RATE DATA (AMC II):
 MAXIMUM ALLOWABLE STREET FLOW DEPTH (FEET) = 0.90
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
                                                                                                                 Fρ
                                                                                LAND USE
                                                                                               GROUP (ACRES) (INCH/HR) (DECIMAL) CN
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =
                                              34.54
                                                                             RESIDENTIAL
   ***STREET FLOWING FULL***
                                                                             "3-4 DWELLINGS/ACRE" B 0.34 0.75 0.600
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                                                                             RESIDENTIAL
                                                                             "5-7 DWELLINGS/ACRE" B 8.08 0.75 0.500
   STREET FLOW DEPTH(FEET) = 0.62
   HALFSTREET FLOOD WIDTH (FEET) = 23.81
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
   AVERAGE FLOW VELOCITY (FEET/SEC.) = 2.86
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.504
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.76
                                                                             SUBAREA AREA (ACRES) = 8.42 SUBAREA RUNOFF (CFS) = 19.01
 STREET FLOW TRAVEL TIME (MIN.) = 2.79 Tc (MIN.) = 14.42
                                                                             EFFECTIVE AREA(ACRES) = 24.96 AREA-AVERAGED Fm(INCH/HR) = 0.36
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.940
                                                                             AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 SUBAREA LOSS RATE DATA (AMC II):
                                                                             TOTAL AREA(ACRES) = 25.0
                                                                                                           PEAK FLOW RATE(CFS) =
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                      Fρ
                                              Αp
                                                    SCS
     LAND USE
                   GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                             SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 RESIDENTIAL
                                                                             5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                            0.500
                                                    56
 "5-7 DWELLINGS/ACRE"
                     В
                              6.46
                                      0.75
                                                                           *******************
 COMMERCIAL
                     В
                              0.09
                                      0.75
                                              0.100 56
                                                                             FLOW PROCESS FROM NODE 21463.00 TO NODE 21464.00 IS CODE = 54
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.495
                                                                           ______
 SUBAREA AREA(ACRES) = 6.55
                             SUBAREA RUNOFF (CFS) = 15.15
                                                                             >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 EFFECTIVE AREA(ACRES) = 16.54 AREA-AVERAGED Fm(INCH/HR) = 0.36
                                                                            >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <<<<
 AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.48
                                                                           _____
 TOTAL AREA (ACRES) = 16.5 PEAK FLOW RATE (CFS) =
                                                                             ELEVATION DATA: UPSTREAM(FEET) = 1211.00 DOWNSTREAM(FEET) = 1205.00
                                                   38.47
                                                                             CHANNEL LENGTH THRU SUBAREA (FEET) = 384.00 CHANNEL SLOPE = 0.0156
                                                                             CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
                                                                             MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
                                                                             CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                                                          56.67
 END OF SUBAREA STREET FLOW HYDRAULICS:
                                                                             FLOW VELOCITY (FEET/SEC.) = 10.12 FLOW DEPTH (FEET) = 1.25
 DEPTH (FEET) = 0.64 HALFSTREET FLOOD WIDTH (FEET) = 24.79
                                                                             TRAVEL TIME (MIN.) = 0.63 Tc (MIN.) = 15.51
 FLOW VELOCITY (FEET/SEC.) = 2.95 DEPTH*VELOCITY (FT*FT/SEC.) = 1.88
                                                                             LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21464.00 = 1758.02 FEET.
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 478.6 FT WITH ELEVATION-DROP = 3.0 FT, IS 19.5 CFS,
                                                                           ********************
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE 21462.00
                                                                             FLOW PROCESS FROM NODE 21464.00 TO NODE 2164.00 IS CODE = 81
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21462.00 = 1105.36 FEET.
                                                                             >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
******************
                                                                           _____
 FLOW PROCESS FROM NODE 21462.00 TO NODE 21463.00 IS CODE = 54
                                                                             MAINLINE Tc(MIN.) = 15.51
______
                                                                             * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.815
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
                                                                             SUBAREA LOSS RATE DATA (AMC II):
                                                                             DEVELOPMENT TYPE/ SCS SOIL AREA
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
                                                                                                                 Fр
_____
                                                                                                 GROUP (ACRES) (INCH/HR) (DECIMAL) CN
                                                                                 LAND USE
 ELEVATION DATA: UPSTREAM(FEET) = 1216.00 DOWNSTREAM(FEET) = 1211.00
                                                                             RESIDENTIAL
 CHANNEL LENGTH THRU SUBAREA (FEET) = 268.66 CHANNEL SLOPE = 0.0186
                                                                             "5-7 DWELLINGS/ACRE" B
                                                                                                        6.76
                                                                                                                  0.75 0.500
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
                                                                             SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
                                                                             SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.500
 CHANNEL FLOW THRU SUBAREA(CFS) =
                                                                             SUBAREA AREA (ACRES) = 6.76 SUBAREA RUNOFF (CFS) = 14.85
                               38.47
 FLOW VELOCITY (FEET/SEC.) = 9.78 FLOW DEPTH (FEET) = 0.99
                                                                             EFFECTIVE AREA(ACRES) = 31.72 AREA-AVERAGED Fm(INCH/HR) = 0.37
                                                                             AREA-AVERAGED Fp(INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TRAVEL TIME (MIN.) = 0.46 Tc (MIN.) = 14.88
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21463.00 = 1374.02 FEET.
                                                                             TOTAL AREA(ACRES) = 31.7
                                                                                                           PEAK FLOW RATE(CFS) =
```

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK (FEET) = 10.00

SCS

56

56

56.67

69.92

Date: 04/21/2014 Date: 04/21/2014 File name: LR0214ZZ.RES File name: LR021477.RFS Page 39 Page 40

```
SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
********************
 FLOW PROCESS FROM NODE 21464.00 TO NODE 21465.00 IS CODE = 54
______
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1205.00 DOWNSTREAM(FEET) = 1197.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 540.00 CHANNEL SLOPE = 0.0148
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                              69.92
 FLOW VELOCITY (FEET/SEC.) = 10.48 FLOW DEPTH (FEET) = 1.39
 TRAVEL TIME (MIN.) = 0.86 Tc (MIN.) = 16.37
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21465.00 = 2298.02 FEET.
********************
 FLOW PROCESS FROM NODE 21465.00 TO NODE 21465.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 16.37
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.725
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/
                   SCS SOIL AREA
                                    Fρ
                                            Aр
                                                  SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                      В
                             0.08
                                  0.75
                                            0.100 56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                    В
                           7.60
                                     0.75
                                            0.500
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.496
 SUBAREA AREA (ACRES) = 7.68
                            SUBAREA RUNOFF (CFS) = 16.27
 EFFECTIVE AREA(ACRES) = 39.40 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.75 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) =
                     39.4
                              PEAK FLOW RATE(CFS) =
                                                   83.64
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21465.00 TO NODE 21466.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
______
 ELEVATION DATA: UPSTREAM(FEET) = 1197.00 DOWNSTREAM(FEET) = 1187.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 678.50 CHANNEL SLOPE = 0.0147
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
                              83.64
 FLOW VELOCITY (FEET/SEC.) = 10.97 FLOW DEPTH (FEET) = 1.52
 TRAVEL TIME (MIN.) = 1.03 Tc (MIN.) = 17.40
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21466.00 = 2976.52 FEET.
*******************
 FLOW PROCESS FROM NODE 21466.00 TO NODE 21466.00 IS CODE = 81
```

>>>>ADDITION OF SUBARE	ואדבא חד ב	THE DEAK	FI.OW<<<<		
MAINLINE Tc(MIN.) = 1 * 10 YEAR RAINFALL INT		711/11D) —	2 627		
SIIBAREA LOSS RATE DATA (	AMC TT) ·	,			
DEVELOPMENT TYPE/ LAND USE	SCS SOIL	AREA	Fp	Ар	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
COMMERCIAL	В	0.26	0.75	0.100	56
RESIDENTIAL	_	0.00	0.55	0 500	F. C
"5-7 DWELLINGS/ACRE" RESIDENTIAL	В	8.00	0.75	0.500	56
"3-4 DWELLINGS/ACRE"	В	0.11	0.75	0.600	56
SUBAREA AVERAGE PERVIOU				.75	
SUBAREA AVERAGE PERVIOU					
SUBAREA AREA(ACRES) = EFFECTIVE AREA(ACRES) =					
AREA-AVERAGED Fp(INCH/H					= 0.37
TOTAL AREA (ACRES) =	47.8	PEAK	FLOW RATE (	CFS) =	97.20
SUBAREA AREA-AVERAGED R					
5M = 0.30; 30M = 0.61;	1HR = 0.80	); 3HR = 1	1.29; 6HR =	1.74; 24HI	R = 3.12
******	*****	*****	*****	*****	*****
FLOW PROCESS FROM NODE	21466.00	TO NODE	21467.00 I	S CODE = !	54
>>>>COMPUTE TRAPEZOIDA					
>>>>TRAVELTIME THRU SU	BAREA (EX.	LSTING EL	======================================		
ELEVATION DATA: UPSTREA	M(FEET) =	1187.0	0 DOWNSTRE	AM(FEET) =	1170.00
CHANNEL LENGTH THRU SUB					
CHANNEL BASE (FEET) =					
MANNING'S FACTOR = 0.01				.50	
CHANNEL FLOW THRU SUBAR FLOW VELOCITY (FEET/SEC.				- 1 64	
TRAVEL TIME (MIN.) = 1				- 1.04	
LONGEST FLOWPATH FROM N	000 21100	).UU TO N	ODE 21467.	00 = 41	6.53 FEET.
******	*****	******	*****	*****	*****
	*****	******	*****	*****	*****
******	******* 21467.00	******** TO NODE	**************************************	*****	*****
**************************************	**************************************	******** TO NODE	********* 21467.00 I: FLOW<	******** S CODE = {	*****
************************  FLOW PROCESS FROM NODE	************ 21467.00  A TO MAINI 	******** TO NODE LINE PEAK	********** 21467.00 I: FLOW<<<<	******** S CODE = {	*****
*************************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT	*********** 21467.00 A TO MAINI 9.14 ENSITY(ING	******** TO NODE LINE PEAK	********** 21467.00 I: FLOW<<<<	******** S CODE = {	*****
********************  FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA(	********** 21467.00 A TO MAINI ======= 9.14 ENSITY(ING	TO NODE LINE PEAK CH/HR) =	********* 21467.00 I: FLOW<<<<	************ S CODE = {	********* 31 
*************************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC(MIN.) = 1  * 10 YEAR RAINFALL INT	********* 21467.00 A TO MAINI 9.14 ENSITY(INC AMC II): SCS SOIL	******** TO NODE LINE PEAK	********* 21467.00 I: FLOW<<<<	************ S CODE = {	**************************************
*******************  FLOW PROCESS FROM NODE  >>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL	********* 21467.00 A TO MAINI 9.14 ENSITY(INC AMC II): SCS SOIL GROUP	TO NODE LINE PEAK CH/HR) = AREA (ACRES)	********* 21467.00 I: FLOW<<<<	Ap (DECIMAL)	**************************************
*****************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  ===================================	********* 21467.00 A TO MAINI 9.14 ENSITY(INC AMC II): SCS SOIL GROUP B	******** TO NODE LINE PEAK	********* 21467.00 I: FLOW<<<<	************ S CODE = {	**************************************
*****************  FLOW PROCESS FROM NODE	********* 21467.00 A TO MAINI 9.14 ENSITY(INC AMC II): SCS SOIL GROUP B	TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  7.62	2.481  Fp (INCH/HR) 0.75	Ap (DECIMAL)	**************************************
*****************  FLOW PROCESS FROM NODE  >>>>>ADDITION OF SUBARE  MAINLINE TC (MIN.) = 1  * 10 YEAR RAINFALL INT SUBAREA LOSS RATE DATA ( DEVELOPMENT TYPE/ LAND USE RESIDENTIAL  "5-7 DWELLINGS/ACRE" AGRICULTURAL FAIR COVER "ORCHARDS"	********* 21467.00 A TO MAINI 9.14 ENSITY(INC AMC II): SCS SOIL GROUP B	******** TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  7.62  1.76	********* 21467.00 I: FLOW<<<<< 2.481  Fp (INCH/HR) 0.75 0.63	Ap (DECIMAL) 0.500 1.000	**************************************
*****************  FLOW PROCESS FROM NODE	********* 21467.00	******** TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  7.62  1.76	2.481  Fp (INCH/HR) 0.75	Ap (DECIMAL) 0.500 1.000	**************************************
******************  FLOW PROCESS FROM NODE	********* 21467.00	********* TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  7.62  1.76 2.13  0.15	********* 21467.00 II FLOW<<<<< 2.481  Fp (INCH/HR) 0.75 0.63 0.75 0.75	Ap (DECIMAL)  0.500  1.000 0.100  0.600	**************************************
*******************  FLOW PROCESS FROM NODE	********* 21467.00	******** TO NODE  LINE PEAK  CH/HR) =  AREA (ACRES)  7.62  1.76 2.13  0.15  FE, FP(INC	********* 21467.00 II FLOW<<<<< 2.481  Fp (INCH/HR) 0.75 0.63 0.75 0.75 CH/HR) = 0	Ap (DECIMAL)  0.500  1.000 0.100  0.600	**************************************
******************  FLOW PROCESS FROM NODE	21467.00 A TO MAINI 9.14 ENSITY(INCAMC II): SCS SOIL GROUP B B B B S LOSS RAS	******** TO NODE LINE PEAK CH/HR) = AREA (ACRES) 7.62 1.76 2.13 0.15 FE, FP(ING ACTION, A)	*********  21467.00 II  FLOW<<<<  2.481  Fp (INCH/HR)  0.75  0.63 0.75  0.75  CH/HR) = 0 p = 0.504	Ap (DECIMAL)  0.500  1.000 0.100  0.600 .71	**************************************

File name: LR0214ZZ.RES

Page 42

Date: 04/21/2014

```
59.43 AREA-AVERAGED Fm(INCH/HR) = 0.36
 EFFECTIVE AREA(ACRES) =
 AREA-AVERAGED Fp(INCH/HR) = 0.74 AREA-AVERAGED Ap = 0.49
 TOTAL AREA (ACRES) = 59.4 PEAK FLOW RATE (CFS) = 113.17
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
*****************
 FLOW PROCESS FROM NODE 21467.00 TO NODE 21468.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1170.00 DOWNSTREAM(FEET) = 1156.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 1415.51 CHANNEL SLOPE = 0.0099
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA (CFS) =
                             113.17
 FLOW VELOCITY (FEET/SEC.) = 10.18 FLOW DEPTH (FEET) = 1.91
 TRAVEL TIME (MIN.) = 2.32 Tc (MIN.) = 21.46
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21468.00 = 5572.04 FEET.
*******************
 FLOW PROCESS FROM NODE 21468.00 TO NODE 21468.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 21.46
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.316
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                                  SCS
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
     LAND USE
 COMMERCIAL
                    В
                            0.73
                                     0.75
                                            0.100
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE" B
                           0.64
                                     0.75
                                            0.600
                                                 56
 RESIDENTIAL
                                                  56
 "5-7 DWELLINGS/ACRE"
                   в 11.78
                                            0.500
                                    0.75
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                             2.68
                                    0.63
                                          1.000
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.71
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.570
 SUBAREA AREA(ACRES) = 15.83
                            SUBAREA RUNOFF (CFS) = 27.21
 EFFECTIVE AREA(ACRES) = 75.26 AREA-AVERAGED Fm(INCH/HR) = 0.37
 AREA-AVERAGED Fp (INCH/HR) = 0.73 AREA-AVERAGED Ap = 0.51
 TOTAL AREA(ACRES) = 75.3 PEAK FLOW RATE(CFS) = 131.58
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
******************
 FLOW PROCESS FROM NODE 21468.00 TO NODE 21469.00 IS CODE = 54
.....
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <
_____
 ELEVATION DATA: UPSTREAM(FEET) = 1156.00 DOWNSTREAM(FEET) = 1117.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 3195.53 CHANNEL SLOPE = 0.0122
 CHANNEL BASE (FEET) = 2.00 "Z" FACTOR = 2.000
```

```
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 4.50
 CHANNEL FLOW THRU SUBAREA(CFS) =
 FLOW VELOCITY (FEET/SEC.) = 11.45 FLOW DEPTH (FEET) = 1.95
 TRAVEL TIME (MIN.) = 4.65 Tc (MIN.) = 26.11
 LONGEST FLOWPATH FROM NODE 21460.00 TO NODE 21469.00 = 8767.57 FEET.
**********************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 81
______
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
______
 MAINLINE Tc (MIN.) = 26.11
 * 10 YEAR RAINFALL INTENSITY (INCH/HR) = 2.059
 SUBAREA LOSS RATE DATA (AMC II):
 DEVELOPMENT TYPE/
                 SCS SOIL AREA
                                 Fp
                                                 SCS
    LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 COMMERCIAL
                           8.14 0.75
                                         0.100
                     В
                                                  56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"
                     В
                          7.28
                                    0.63
                                           1.000
                                                  65
                     B 6.06
                                    0.75
                                           0.850
                                                  56
 PUBLIC PARK
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"
                            3.35
                                    0.75
                                           0.500
                                                  56
 RESIDENTIAL
                     В
 "3-4 DWELLINGS/ACRE"
                            0.97
                                    0.75
                                           0.600
                                                  56
 RESIDENTIAL
                          0.23
 ".4 DWELLING/ACRE"
                    В
                                    0.75 0.900
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.69
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.603
 SUBAREA AREA (ACRES) = 26.03
                         SUBAREA RUNOFF(CFS) = 38.44
 EFFECTIVE AREA(ACRES) = 101.29 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp (INCH/HR) = 0.72 AREA-AVERAGED Ap = 0.53
 TOTAL AREA (ACRES) = 101.3
                             PEAK FLOW RATE(CFS) =
                                               152.61
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
********************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21469.00 IS CODE = 1
_______
 >>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<
>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<
______
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION (MIN.) = 26.11
 RAINFALL INTENSITY (INCH/HR) = 2.06
 AREA-AVERAGED Fm(INCH/HR) = 0.39
 AREA-AVERAGED Fp(INCH/HR) = 0.72
 AREA-AVERAGED Ap = 0.53
 EFFECTIVE STREAM AREA(ACRES) = 101.29
 TOTAL STREAM AREA(ACRES) = 101.29
 PEAK FLOW RATE (CFS) AT CONFLUENCE = 152.61
 ** CONFLUENCE DATA **
 STREAM
        0
                Tc
                       AREA
                               HEADWATER
 NUMBER (CFS) (MIN.) (ACRES)
                                NODE
 1 4279.97 68.07 14163.99 20120.00
  2 152.61 26.11
                      101.29 21460.00
```

Date: 04/21/2014 File name: LR0214ZZ.RES

Page 44

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.39;6H= 1.97;24H= 3.95
 S-GRAPH: VALLEY(DEV.) = 77.5%; VALLEY(UNDEV.) / DESERT = 22.5%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.13; LAG(HR) = 0.91; Fm(INCH/HR) = 0.47; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
 UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14265.3
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21469.00 = 55601.11 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0271; Lca/L=0.4,n=.0243; Lca/L=0.5,n=.0223; Lca/L=0.6,n=.0209
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2086.54
 PEAK FLOW RATE(CFS) = 4176.38
   (UPSTREAM NODE PEAK FLOW RATE (CFS) = 4279.97)
 PEAK FLOW RATE (CFS) USED = 4279.97
******************
 FLOW PROCESS FROM NODE 21469.00 TO NODE 21470.00 IS CODE = 54
 >>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT) <>>>
______
 ELEVATION DATA: UPSTREAM(FEET) = 1117.00 DOWNSTREAM(FEET) = 1110.00
 CHANNEL LENGTH THRU SUBAREA (FEET) = 370.28 CHANNEL SLOPE = 0.0189
 CHANNEL BASE (FEET) = 22.00 "Z" FACTOR = 2.000
 MANNING'S FACTOR = 0.015 MAXIMUM DEPTH (FEET) = 11.00
 CHANNEL FLOW THRU SUBAREA(CFS) = 4279.97
 FLOW VELOCITY (FEET/SEC.) = 30.38 FLOW DEPTH (FEET) = 4.53
 TRAVEL TIME (MIN.) = 0.20 Tc (MIN.) = 68.28
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21470.00 = 55971.39 FEET.
******************
 FLOW PROCESS FROM NODE 21470.00 TO NODE 21471.00 IS CODE = 81
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<
_____
 MAINLINE Tc(MIN.) = 68.28
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.157
 SUBAREA LOSS RATE DATA (AMC II):
  DEVELOPMENT TYPE/ SCS SOIL AREA
                                     Fp Ap SCS
     LAND USE
                    GROUP (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
                               17.62
                                                 0.500 56
 "5-7 DWELLINGS/ACRE"
                     В
                                         0.75
                              0.37
                                                 0.100 56
 COMMERCIAL
                        В
                                         0.75
 PUBLIC PARK
                        В
                                0.37
                                         0.75
                                                 0.850 56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.499
 SUBAREA AREA(ACRES) = 18.36
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.81;3H= 1.39;6H= 1.97;24H= 3.95
 S-GRAPH: VALLEY (DEV.) = 77.5%; VALLEY (UNDEV.) / DESERT= 22.5%
         MOUNTAIN= 0.0%; FOOTHILL= 0.0%; DESERT (UNDEV.) = 0.0%
 Tc(HR) = 1.14; LAG(HR) = 0.91; Fm(INCH/HR) = 0.47; Ybar = 0.56
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.
 DEPTH-AREA FACTORS: 5M = 0.60; 30M = 0.62; 1HR = 0.63;
 3HR = 0.92; 6HR = 0.96; 24HR = 0.98
```

File name: LR021477.RFS

Page 45

Date: 04/21/2014

```
UNIT-INTERVAL (MIN) = 5.00 TOTAL AREA (ACRES) = 14283.6
 LONGEST FLOWPATH FROM NODE 20120.00 TO NODE 21471.00 = 55971.39 FEET.
 EOUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3, n=.0271; Lca/L=0.4, n=.0243; Lca/L=0.5, n=.0223; Lca/L=0.6, n=.0208
 TIME OF PEAK FLOW(HR) = 16.92 RUNOFF VOLUME(AF) = 2088.90
 UNIT-HYDROGRAPH PEAK FLOW RATE (CFS) = 4165.60
 TOTAL AREA(ACRES) = 14283.6
                          PEAK FLOW RATE (CFS) = 4279.97
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
 SUBAREA AREA-AVERAGED RAINFALL DEPTH (INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12
************************
 FLOW PROCESS FROM NODE 21470.00 TO NODE 21470.00 IS CODE = 152
 >>>>STORE PEAK FLOWRATE TABLE TO A FILE<
_____
 PEAK FLOWRATE TABLE FILE NAME: 21470.DNA
END OF STUDY SUMMARY:
 TOTAL AREA(ACRES) = 14283.6 TC(MIN.) =
                                      68.28
 AREA-AVERAGED Fm (INCH/HR) = 0.47 Ybar = 0.56
 PEAK FLOW RATE (CFS) = 4279.97
______
_______
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```